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BLUE JAY

December 1994

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Blue Jay

Vol. 52 No.4 December 1994 185-248

Conservation

AGRICULTURAL POLICY REVIEW PART 3: MUNICIPAL ASSESSMENT AND TAXATION. *Fred Thornton, Joce Bowman and David Struthers* 185

Plants

FLORA OF THE BESNARD LAKE AREA, NORTH-CENTRAL SASKATCHEWAN. *Vernon L. Harms and Anna Leighton* 190

Midges

ADDITIONS AND CORRECTIONS TO THE LIST OF NON-BITING MIDGES IN SASKATCHEWAN. *P.G. Mason and D.W. Parker* 200

Birds

BURROWING MITES THAT PESTER BIRDS. William J. Van Scheik 204
DISTANT TRAVELS OF TREE SWALLOWS OF THE PRAIRIE PROVINCES, 1968-1992. *Donald J. Stiles and Mary I. Houston* 206
RESCUE OPERATION - SWALLOWS. *Keith Barr* 213
BIRDS THAT I THOUGHT I HAVE KNOWN. *Keith Barr* 214
CACHING BY AN IRRUPTIVE HAWK-OWL. *Douglas B. McNair* 216

Mammals

THE PUMA IN THE CENTRAL MOUNTAINS AND GREAT PLAINS — A SYNOPSIS. *Jay W. Tischendorf and F. Robert Henderson* 218

Nature Library

KNEE-HIGH NATURE\WINTER — A GUIDE TO NATURE ACTIVITIES AND FUN. *Reviewed by John Pollock* 224
WISDOM OF THE ELDERS. *Reviewed by Henry Epp* 225

Letters

FLYING SQUIRRELS IN THE DEAD OF WINTER. *Terry and Randy Langelier* 227
ALBINO GREAT GRAY OWL IN FINLAND. *Ignaz Wanders* 228

In Memoriam

GORDON SILVERSIDES, 1927-1994. *Pat Adams* 229

Society Notes

NATURE SASKATCHEWAN 1994 ANNUAL GENERAL MEETING 231
LEDINGHAM RECEIVES SASKATCHEWAN ORDER OF MERIT 231
INDEX TO VOLUME 52, 1994. Gail Bunt 235

Announcements

SASKATCHEWAN CHRISTMAS BIRD AND MAMMAL COUNTS - 1994 ii
Errata 212

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SASKATCHEWAN CHRISTMAS BIRD AND MAMMAL COUNTS — 1994

The dates for the Christmas Bird and Mammal counts this year are **Saturday, 17 December 1994, through Tuesday, 2 January 1995,** inclusive. Count area should be a circle 24 km (15 mi.) in diameter. Count area must be a minimum of three hours in duration. An information package, including count forms, will be mailed to all previous count compilers in early December. Anyone wishing to initiate a new count should contact:

Wayne C. Harris
Box 414, Raymore, Saskatchewan S0A 3J0
Phone (306) 746-4544 (answering machine)
Fax (306) 746-4519

All counts must arrive by **Monday, 9 January 1994,** to be included in the compilation of bird and mammal count results.

CONSERVATION

AGRICULTURAL POLICY REVIEW PART 3: MUNICIPAL ASSESSMENT AND TAXATION

FRED THORNTON, JOCE BOWMAN, and DAVID STRUTHERS, Western
Resource Management Associates, Box 4-B, Site 2, Yorkton, Saskatchewan.
S3N 2V4

Saskatchewan farmers are subjected to taxes from three levels of government: federal, provincial, and municipal. All tax policies may ultimately affect the manner in which farmlands are managed, but the most pervasive impacts are those stemming from the municipal tax system of assessing land and collecting property taxes.[5] Of all taxes, modifications at the municipal level would probably be the best way to encourage environmentally sound land use practices. R.M. Bird notes the potential for using property tax to effect specific land management goals.[5] Rosaasen makes similar observations by suggesting that, if an entirely different perspective of the property tax structure and good management practices were employed, land use patterns might change radically.[3]

The Municipal Tax System In Canada, property tax is the main source of the revenue that supports services provided by local governments. In Saskatchewan, all property tax in rural areas is assessed by the Saskatchewan Assessment Management Agency (SAMA). SAMA is responsible for developing assessment procedures, valuing property, and providing the assessments to local governments. The agency is governed by a board of directors representing both local and provincial governments. Through their representatives, local governments are given the opportunity to actively participate in the administration of property assessments.

Currently, the value at which a particular property is assessed is a function of its productivity and market value. The amount of property tax that an individual landowner pays is determined by the mill rate set by each municipal council. The mill rate is determined by dividing the municipality's total revenue requirements by the total assessment within its respective boundaries.[4] In Saskatchewan, rural municipalities are restricted to levying one uniform mill rate to all property.

Assessment In Saskatchewan, the assessment of arable agricultural land is based on the productivity of the soils present within a given unit of land.[1] Each soil type is assigned a numerical Master Rating that is determined by three factors: climate, texture, and the soil profile. The Master Rating is then modified by assessing physical factors which reduce the soil's productivity: gravel and sand pockets interspersed in the soil profile, salinity, solodization, burn-outs, podzolization, drainage, flooding, and other conditions affecting crop yields. Economic factors which reflect increased production costs are also identified. These include stones, topography, trees, and/or natural and man-made hazards (e.g., draws, ravines, creeks, roads, ditches, etc.). An economic adjustment is made to reflect the increased production costs associated with these factors. The Final Rating for the land unit is determined by subtracting the physical and economic factors from the Master Rating. The assessment for a parcel of land is determined by the Final Rating and is adjusted to account for regional differences in freight rates, fuel costs, and distance from local markets.

A different basis is used for assessing land that still supports native vegetation. Native land used as pasture is assessed based on its potential livestock carrying capacity. Native land used for hay production is assessed based on its potential forage yield and quality. Non-arable land, or “waste land” as it is termed on the assessment, is assessed a minimal value. If any of this land comes under cultivation, then its subsequent assessment is based on the land productivity rating system described for arable land. Assessment under this system invariably increases the assessed value of the parcel that has been cultivated.

Potential Impacts to the Landscape In its current form, the property assessment and taxation system contradicts the principles of environmental sustainability. The system was created to generate revenue for services and development within rural municipalities. The assessment and taxation system continues to provide incentives for development that negatively impacts the landscape:

1) All lands, regardless of economic value, are assessed and taxed.[5] Historically, farmers had livestock that were pastured on unbroken, native land in the summer and consumed native hay during the winter. Nearly all land had some grazing value and it was legitimately assessed and taxed at rates that reflected this value. However, farm units are no longer the relatively small, mixed operations that were common when the system was inaugurated. Technological advances and economic trends have fostered the development of specialized farms (e.g., grain). Modern farmers, specializing in the production of cultivated crops, often see no benefits accruing from unbroken land and, if it interferes with the operation of equipment, may even consider it a liability. To continue taxing such land may encourage some farmers to cultivate it in order to recoup tax dollars;

2) Tax notices are presented as a lump sum figure with no distinction made between taxes paid on arable versus non-arable land. Producers do not have a good understanding of assessment procedures, and many believe they are taxed equally on all land. This provides farmers, who wish to recover tax dollars, with an excuse to break land;

3) Unbroken land that is considered potentially arable is assessed at a higher rate than undeveloped land having no crop-producing capabilities. This encourages farmers to break the remaining arable acres to exploit their crop-producing potential and indirectly increases the threat of encroachment on adjacent non-arable acres. A farmer breaking the arable land may be tempted to “square his field” by cultivating adjacent non-arable acreage;

4) Cultivated land that is seeded

back to perennial cover continues to be taxed at the higher rate for cultivated land. This discourages crop diversification and penalizes farmers who seed forages for soil conservation benefits; and

5) Land is assessed based on its productivity. This can penalize farmers who implement management practices that maintain or improve the quality of their land.[3] Improved productivity results in higher assessments and, therefore, increased taxes.

Possible Solutions Zittlau recommends several modifications to the municipal assessment and taxation system that would result in a system that could facilitate positive land management goals:[5]

1) Discontinue the tax on uncultivated, non-arable land in order to provide farmers with an incentive to maintain such land in a natural state;

2) Revise tax notices so taxes due on each land class are presented individually. If the practice of taxing uncultivated land was discontinued, farmers who persisted in cultivating this land would be reminded of the price they pay in doing so;

3) Potentially arable land that is less than a specified size or represents less than a fixed percentage of a contiguous undeveloped area should be assessed and taxed at the same rate as adjacent non-arable acreage; or

4) To offset the potential tax revenue lost by municipalities from such recommendations, shift taxes from uncultivated, non-arable land to cultivated acreage either by assessing productive land at a higher rate or through an increase in the mill rate. An alternative is to increase provincial/municipal payments by an amount that would allow municipalities to recover revenues lost when lands providing social and environmental benefits are exempted from taxation.

Rosaasen states that management of cultivated lands could be directly influenced by Saskatchewan's property taxation system.[3] He recommends taxes be linked to an organic matter index. If the index increased between assessments, taxes would decline; but, if the index decreased, taxes would rise. The incentive for proper management would be consistent with society's view of land management. The Sixth Annual Western Provinces Conference recognized land assessment and taxation as one of several policies having a major affect on soil and water conservation.[2] Recommendations on policy reform included:

1) Remove or reduce taxes on conservation land. The resulting reduction in the municipal tax base should be the fiscal responsibility of society as a whole, as it is the benefactor;

2) Cultivated land, converted to perennial cover for soil conservation or salinity control, should be assessed on its livestock carrying capacity as opposed to the higher cultivation rate, as presently employed; and

3) Benefits should be given directly to farmers who implement soil and water conservation practices. These benefits could be in the form of reduced mill rates, as assessments should be conservation neutral and not expected to drive conservation programs.

The Municipal Perspective There are many municipalities in Saskatchewan that are experiencing fiscal difficulties. A proposal that recommends tax concessions on certain land categories within their constituency would likely be considered as a threat to their tax base and reduce their ability to provide services. However, because of the political nature of municipal governments, most municipal planning reflects short-term goals. Over the long-term, a property tax system that provides continuing incentives to drain, clear, and/or cultivate agricultural land is not in the best interest of municipal governments as it may lead to increased erosion over a much broader area and an overall reduction in the land's productivity. In the short-term, additional cultivated acreage may generate increased revenues, but the long-term decline in the land's productivity will translate into a lower assessment and reduced tax revenue.

At present, assessment information is only updated every five to ten years because current procedures are very time consuming and labour intensive. It would be in the best interest of rural municipalities to use satellite imagery and soil survey data within a Geographic Information System's (GIS) database. This would allow constant updating of land use which forms the basis of the assessment system.

Planned Changes to the Assessment System In 1992, Saskatchewan was to have implemented a revised assessment system, but this was put on hold pending further review by municipal governments. The present assessment system is based on average 1961 to 1970 market and replacement cost data, commonly referred to as 1965 level values. Agricultural land is valued using a productivity indexing system that relates soil productivity to the province-wide average market value of farmland in the 1961 to 1970 period.[4] The proposed revisions will reflect more up to date market value relationships. To accomplish this, assessments are to be based on the average 1987 market value of properties. The revised system will still use productivity as the basis of comparison for arable agricultural land, carrying capacity for the basis of comparison on pasture land, and forage yield as the basis of comparison for forage land. Productivity indexes will reflect current yield data. Soil productivity will relate to the average market value of each major soil association, rather than the province-wide average market value of farmland in the 1965 value period.

These proposed changes do not address the environmental impacts of the assessment and taxation system. The executive director of the SAMA has stated that his agency has not yet adopted a policy regarding the impact of land assessment on the conservation of Saskatchewan's soil and environmental resources.

In summary, Saskatchewan's municipal assessment and taxation system was enacted to provide local governments with an equitable method for levying taxes in order to generate revenue. The system based the value of land solely on its ability to produce an agricultural crop, whether grain or livestock. This bias has negatively influenced decisions on land use regarding soil and water conservation. Even though agriculture is an industry that continues to depend on soil, water, and natural ecological processes to survive, the rural assessment system encourages the cultivation of land supporting native vegetation and discourages the establishment of perennial crops on land previously under annual cultivation. This is not a sustainable strategy, nor does it encourage badly needed diversification on the agricultural landscape.

The reluctance of municipal governments to address environmental concerns in the assessment system indicates they have not realized their inherent vulnerability regarding these major issues of sustainability and diversification. The ongoing decline in agricultural productivity that is currently sweeping the prairies directly affects their survival, not only through lower assessments, but through the concurrent drop in the number of rural taxpayers.

This article is published under the auspices of the Saskatchewan Natural History Society, Endangered Species and Spaces Committee and is the third in a four-part series on the effects of agricultural policy in Saskatchewan [see *Blue Jay* 51:3-9 and *Blue Jay* 51:65-71].

1. EWERT, W.A. 1979. Value and valuation theory in assessment. *In*: Rural land assessment manual. Saskatchewan Municipal Affairs. 90 pp.
2. JENKINS, C. 1988. Policies and institutions with an impact on soil and water conservation. Sixth Annual Western Provinces Conference: Rationalization of Soil and Water Research and Management. 84 pp.
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4. SASKATCHEWAN ASSESSMENT MANAGEMENT AGENCY. 1991. Property assessment in Saskatchewan. Saskatchewan Assessment Management Agency, Regina, Saskatchewan.
5. ZITTLAU, W.T. 1979. An environmental assessment of agricultural practices and policies: implications for waterfowl habitat management. The Natural Resource Institute, University of Manitoba. 282 pp.

Typical Saskatchewan scene. *Gary W. Seib*

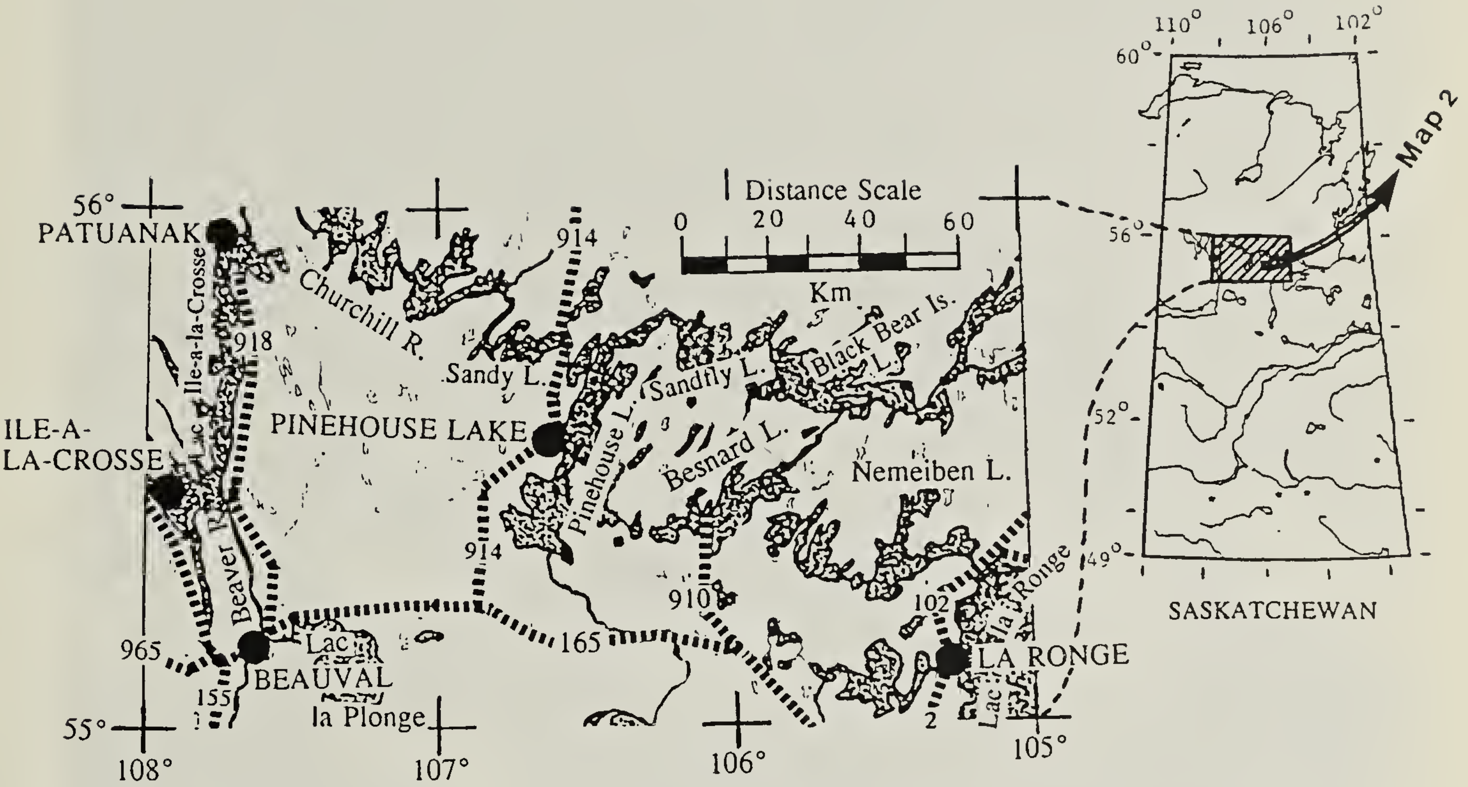
FLORA OF THE BESNARD LAKE AREA, NORTH-CENTRAL SASKATCHEWAN

VERNON L. HARMS, W. P. Fraser Herbarium, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 0W0, and ANNA LEIGHTON, 328 Saskatchewan Crescent West, Saskatoon, Saskatchewan. S7M 0A4

Introduction Besnard Lake in north-central Saskatchewan is located about 20-30 km south of the Churchill River, 60 km west-northwest of LaRonge, and 40 km east-southeast of Pinehouse Lake Village, at between latitudes 55°17' to 31' N, and longitudes 105°47' to 106°17' W. (See Maps 1 and 2.) The area is accessible via the Besnard Lake Road (Hwy. 910) extending north from Hwy. 165 and crossing the Narrows, and the Morning-Clam Lake Road, forking east from the former to skirt Besnard Lake's south side.

Physiographically, Besnard Lake occurs at the southern border of the Canadian Precambrian Shield, with the shield landforms north of the lake

*Tamarack (*Larix laricina*) buds* *Wayne Lynch*

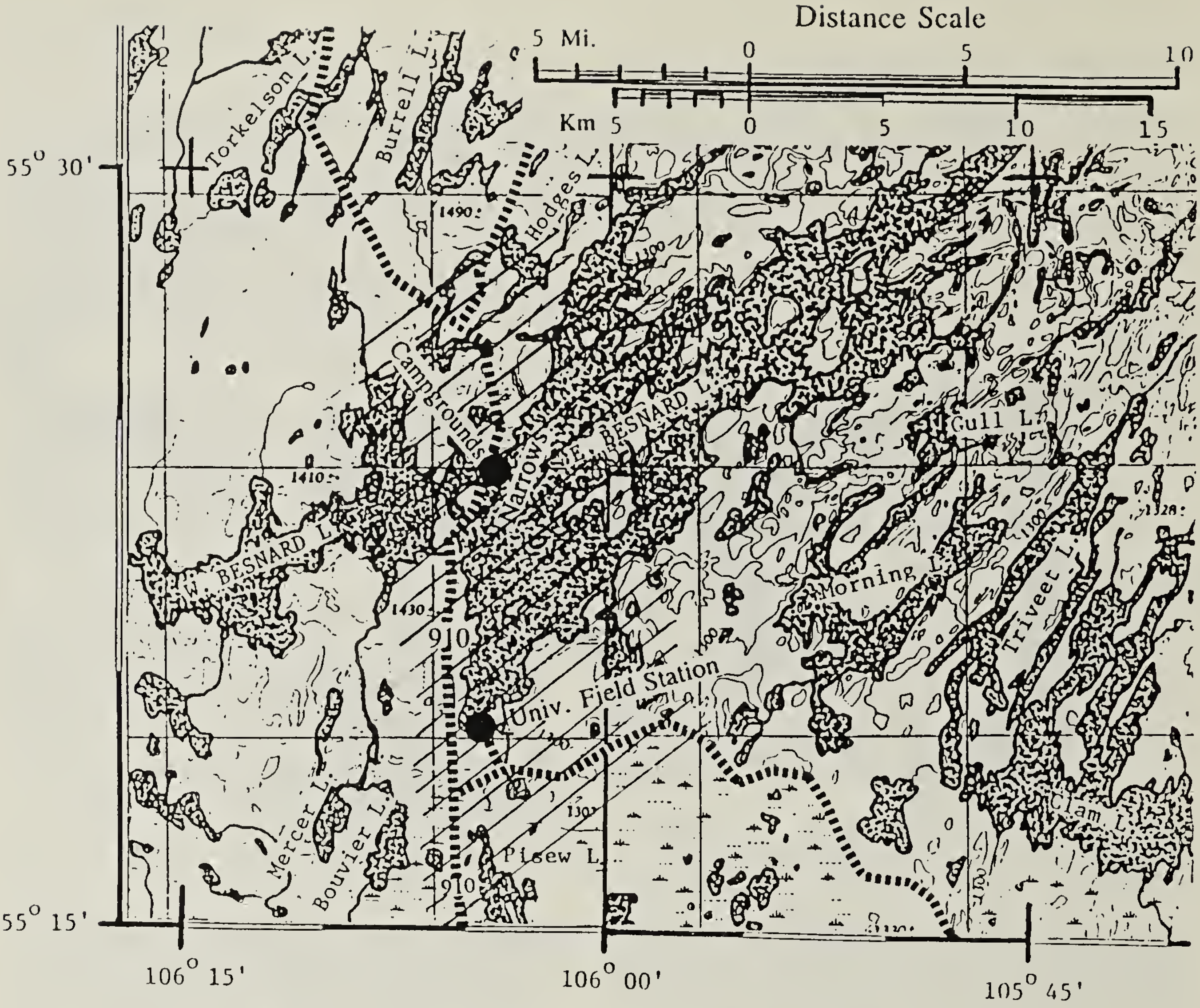


Map 1. LOCATION OF BESNARD LAKE IN NORTH-CENTRAL SASKATCHEWAN.

characterized by numerous granitic rock outcroppings and shallow soil, and the non-shield landforms south of Besnard Lake characterized largely by sandy, lacustrine or till soils, except locally where organic peaty substrates have developed under bogs and fens. This general area of low relief below the 1500-foot contour between the Precambrian Shield to the north and the Saskatchewan Uplands to the south was considered distinctive enough to be separately recognized by Rowe as the Upper Churchill Section (#B.20).[2] It is situated between the Northern Coniferous (#B.22) and the Mixedwood (#B.18a) sections of the Boreal Forest Region of Canada.[2] It was occupied by the post-glacial Lake Hyper-Churchill, resulting in the generally flat to undulating surfaces now present. Apparently, the sandy lacustrine and till deposits were originally derived from thin basal sandstone on the Precambrian basement to the north.[2]

The original Jack Pine forests that predominated on the sandy upland plains and ridges in the Besnard Lake area have been destroyed to a large extent by extensive forestry clearcutting. The lower, moister sites are largely characterized by Black Spruce woods, often admixed with some White Spruce. Limited stands of aspen-dominated deciduous woods and mixedwoods of various combinations of all the aforementioned tree species, plus also Balsam Poplar, White Birch and River Alder, exist mainly near lake shores and some stream margins. Balsam Fir is uncommon and occurs mostly as small, understorey shrubs less than 1 m high in the mixed and spruce woods. Some Tamarack occur with Black Spruce in most treed bogs. Open bogs and fens characterize low, wet, poorly drained depressions.

Besnard Lake is noted for its Bald Eagle nesting sites.[1] With the present



Map 2. BESNARD LAKE AND VICINITY.

location there of a University of Saskatchewan research station under the direction of Dr. Gary R. Bortolotti, it has also become an important study area for other wildlife, especially American Kestrels and other birds of prey, and their rodent prey species.

The following list of 210 species of higher (i.e., vascular) plants (Table 1) was compiled by the authors, based primarily on plant collections made in the general Besnard Lake vicinity by V. L. Harms in June 1992 and by Anna Leighton in 1977-78, but with these supplemented by the 1978 collections of Jon, Naomi and Peter Gerrard, Doug Whitfield and Stacy Tessaro. Despite the wider coordinates given earlier for the general Besnard Lake area, almost all plant collections were made in the Narrows region, on the central islands, and along the south side, between longitudes 105°57' and 106°05' W (see hatched area on Map 2).

The 210 species of vascular plants recorded in the overall area are grouped into 134 genera and 58 families. They include 15 species of pteridophytes (i.e., ferns and fern-allies), 6 species of coniferous gymnosperms, and 189 species of angiosperms (i.e., flowering plants). Less than 4% (i.e., only 8 of 210 species) represent introduced plants (i.e., either invasive weeds or escaped cultigens), which are indicated by asterisks in the subsequent list. The following three plants recorded from the Besnard Lake area are considered rare in Saskatchewan: *Poa arctica* (Arctic Bluegrass), *Polygonum punctatum* var. *confertiflorum* (Dotted Water Smartweed) and *Lilium philadelphium* var. *andinum*

*Bunch Berry (*Cornis canadensis *L.)* *Frank A. Switzer*

forma immaculata (Immaculate Yellow Lily). Voucher specimens documenting all listed plants are filed in the W.P. Fraser Herbarium, at the University of Saskatchewan, Saskatoon, Saskatchewan.

This species inventory list should not be considered a *fait accompli*, but rather a starting point for the finding of additional plant species records from this general area. Conceivably, about 100 more vascular plants might well be expected for an area of this size at this latitude.

Acknowledgements Appreciation is due to Doug Whitfield who hired the junior author as a field assistant in 1977-78, and to the Boreal Institute of the University of Alberta for supporting the former's Bald Eagle studies at Besnard Lake. The voluntary contributions of the Gerrard family, as indicated earlier, are thankfully noted. The senior author's collecting time at Besnard Lake in June 1992 occurred while he was involved with a Boreal Forest Ecology Field Camp sponsored by the University of Saskatchewan Extension Division under the direction of Peter Jonker.

1. GERRARD, J.M. and G.R. BORTOLOTTI. 1988. The Bald Eagle haunts and habitats of a wilderness monarch. Smithsonian Institution, Washington, DC. 177 pp. (Paperback copy published by Western Producer, Saskatoon, SK.)

2. ROWE, J.S. 1972. The forest regions of Canada. Canadian Forestry Service Publ. No. 1300. Ottawa, ON. 172 pp.

*Round-leaved Sundew (*Drosera rotundifola *L.)* *Gary W. Seib*

Table 1. VASCULAR PLANTS RECORDED AND DOCUMENTED IN THE BESNARD LAKE VICINITY.

* = introduced (i.e., non-native) plants; (R) = plants rare in Saskatchewan

ADIANTACEAE (Maidenhair Family)
Cryptogramma crispa (L.) R.Br. var. *acrostichoides* (R.Br.) Clarke - Parsley Fern

ALISMATACEAE (Water-plantain Family)
Sagittaria cuneata Sheld. - Arum-leaved Arrowhead

APIACEAE (Parsley or Carrot Family)
Cicuta maculata L. var. *angustifolia* Hook. - Western Water Hemlock
Cicuta mackenzieana Raup. - Water Hemlock
Sium suave Walt. - Water Parsnip

APOCYNACEAE (Dogbane Family)
Apocynum androsaemifolium L. - Spreading Dogbane

ARACEAE (Arum Family)
Acorus calamus L. - Sweet Flag
Calla palustris L. - Marsh Calla; Wild Arum; Wild Calla-lily

ARALIACEAE (Ginseng Family)
Aralia hispida Vent. - Bristly Sarsaparilla
Aralia nudicaulis L. - Wild Sarsaparilla

ASPLENIACEAE (Spleenwort Family)
Dryopteris carthusiana (Vill.) H.P. Fuchs - Narrow Spinulose Shield Fern
Dryopteris fragrans (L.) Schott. - Fragrant Shield Fern
Gymnocarpium dryopteris (L.) Newm. - Oak Fern
Woodsia ilvensis (L.) R. Br. - Rusty Woodsia

ASTERACEAE (Aster or Composite Family)
Achillea millefolium L. ssp. *borealis* (Bong.) Breit. - Northern Yarrow
Achillea millefolium L. ssp. *borealis* (Bong.) Breit. f. *rhodantha* (LePage) Scoggan - Pink-flowered Northern Yarrow
Achillea millefolium L. ssp. *lanulosa* (Nutt.) Piper - Common Yarrow
Antennaria parvifolia Nutt. - Low or Small Pussytoes or Everlasting
Aster ciliolatus Lindl. - Lindley's Blue Aster

Bidens cernua L. - Smooth Beggar-ticks
Chrysanthemum leucanthemum L. - Oxeye Daisy*
Crepis tectorum L. - Narrow-leaved Hawksbeard*
Erigeron philadelphicus L. - Philadelphia Fleabane
Hieracium umbellatum L. - Canada Hawkweed
Matricaria matricarioides (Less.) Porter - Pineapple Weed*
Petasites palmatus (Ait.) A. Gray - Palmate-leaved Colt's-foot
Senecio indecorus Greene - Unsightly Groundsel
Senecio pauperculus Michx. - Depauperate Groundsel
Solidago canadensis L. var. *salebrosa* (Piper) M.E. Jones - Canada Goldenrod
Solidago hispida Muhl. - Shaggy Goldenrod
Solidago spathulata DC. var. *neoalaskana* (Gray) Cronq. - Mountain Goldenrod

BALSAMINACEAE (Jewelweed Family)
Impatiens capensis Meerb. - Spotted Touch-me-not

BETULACEAE (Birch Family)
Alnus crispa (Ait.) Pursh - Green Alder
Alnus rugosa (Du Roi) Spreng. - Speckled or River Alder
Betula neoalaskana Sarg. - Alaska White or Paper Birch
Betula pumila L. var. *glandulifera* Regel - Glandular Shrub Birch

BORAGINACEAE (Borage Family)
Mertensia paniculata (Ait.) G. Don - Tall Lungwort

BRASSICACEAE (Mustard Family)
Arabis divaricarpa A. Nels. var. *stenocarpa* M. Hopkins - Purple Rock Cress
Arabis hirsuta (L.) Scop. var. *glabrata* T&G - Hirsute Rock Cress
Lepidium densiflorum Schrad. - Common Pepper-grass*
Sisymbrium loeselii L. - Tall Hedge Mustard*

CAMPANULACEAE (Bluebell Family)
Campanula aparinoides Pursh - Marsh Bellflower
Campanula rotundifolia L. - Common Harebell or Bluebell

CAPRIFOLIACEAE (Honeysuckle Family)
Linnaea borealis L. - Twin-flower
Lonicera dioica L. var. *glaucescens* (Rydb.) Butters - Twining Honeysuckle
Viburnum edule (Michx.) Raf. - Low Bush Cranberry

CARYOPHYLLACEAE (Pink Family)
Moehringia lateriflora (L.) Fenzl. - Grove Sandwort
Stellaria calycantha (Ledeb.) Bong. - Northern Chickweed
Stellaria longifolia Muhl. - Long-leaved Stitchwort, Starwort or Chickweed
Stellaria longipes Goldie - Long-stalked Chickweed

CHENOPODIACEAE (Goosefoot Family)
Chenopodium capitatum (L.) Aschers - Strawberry Blite

CORNACEAE (Dogwood Family)
Cornus canadensis L. - Bunch Berry; Dwarf Dogwood

CUPRESSACEAE (Cypress Family)
Juniperus communis L. - Low or Ground Juniper

CYPERACEAE (Sedge Family)
Carex cf. *adusta* Boott. - Browned Sedge
Carex cf. *aenea* Fern - Hay Sedge
Carex aquatilis Wahl. - Water Sedge
Carex atherodes Spreng. - Awned Sedge
Carex aurea Nutt. - Golden Sedge
Carex crawfordii Fern - Crawford's Sedge

Carex disperma Dewey - Soft-leaved or Two-seeded Sedge
Carex houghtonii Torr. - Houghton's Sedge
Carex cf. *lanuginosa* Michx. - Woolly Sedge
Carex rostrata Stokes - Beaked Sedge
Carex stipata Muhl. - Awl-fruited Sedge
Eleocharis palustris (L.) R. & S. - Creeping Spike-rush
Eriophorum angustifolium Honck. - Tall Cotton-grass
Eriophorum brachyantherum Trautv. - Close-sheathed Cotton-grass
Eriophorum chamissonis C.A. Mey. - Chamisso's Cotton-grass
Eriophorum gracile K. Koch - Slender Cotton-grass
Eriophorum vaginatum L. - Sheathed Cotton-grass
Scirpus cyperinus (L.) Kunth - Wool-grass
Scirpus hudsonianus (Michx.) Fern. - Alpine Cotton-grass
Scirpus microcarpus Presl. - Small-fruited Sedge

DROSERACEAE (Sundew Family)
Drosera anglica Huds. - Oblong-leaved Sundew
Drosera rotundifolia L. - Round-leaved Sundew

EQUISETACEAE (Horsetail Family)
Equisetum arvense L. - Common or Field Horsetail
Equisetum fluviatile L. - Swamp or Water Horsetail
Equisetum scirpoides Michx. - Dwarf Scouring-rush; Sedge-like Horsetail
Equisetum sylvaticum L. - Woodland Horsetail
Equisetum variegatum Schleich. - Variegated Horsetail

ERICACEAE (Heath Family)
Andromeda polifolia L. - Bog Rosemary
Arctostaphylos uva-ursi (L.) Spreng. - Common Bearberry; Kinnikinnick
Chamaedaphne calyculata (L.) Moench. - Leatherleaf
Kalmia polifolia Wang. - Pale or Bog Laurel
Ledum groenlandicum Oeder - Common Labrador-tea
Oxycoccus microcarpus Turcz. - Small Bog or Swamp Cranberry
Oxycoccus quadripetalus Gilib. - Larger Bog or Swamp Cranberry
Vaccinium myrtilloides Michx. - Canada Blueberry
Vaccinium vitis-idaea L. - Lingenberry; Dry-ground, Mountain, Low or Bog Cranberry; Cowberry

FABACEAE (Legume or Pea Family)
Astragalus canadensis L. - Canada Milk Vetch
Caragana arborescens Lam. - Caragana; Siberian Pea-shrub*
Lathyrus ochroleucus Hook. - Cream-colored Pea-vine or Vetchling
Trifolium repens L. - White Clover*
Vicia americana Muhl. - American Vetch

FUMARIACEAE (Fumitory Family)
Corydalis aurea Willd. - Golden Corydalis
Corydalis sempervirens (L.) Pers. - Pink or Pale Corydalis

GENTIANACEAE (Gentian Family)
Gentiana amarella L. - Northern Gentian

GERANIACEAE (Geranium Family)
Geranium bicknellii Britt. - Bicknell's Wild Geranium

GROSSULARIACEAE (Currant Family)
Ribes glandulosum Grauer - Skunk Currant
Ribes hudsonianum Richards. - Northern Black Currant
Ribes oxyacanthoides L. s. lato - Northern or Canada Gooseberry

HALORAGIDACEAE (Water-milfoil Family)
Myriophyllum exalbescens Fern. - American Water-milfoil

HYDROPHYLLACEAE (Water-leaf Family)

Phacelia franklinii (R. Br.) A. Gray - Franklin's Scorpion-weed

HYPERICACEAE (St. John's-wort Family)

Hypericum majus (Gray) Britt. - Large Canada St. John's-wort

JUNCACEAE (Rush Family)

Juncus alpinus Vill. var. *rariflorus* Hartm. - Alpine Rush

Juncus dudleyi Wieg. - Dudley's Path Rush

LAMIACEAE (Mint Family)

Lycopus uniflorus Michx. - Northern Water-horehound

Mentha arvensis L. - Wild or Field Mint

Stachys palustris L. var. pilosa (Nutt.) Fern. - Marsh Hedge-nettle

LENTIBULARIACEAE (Bladderwort Family)

Utricularia intermedia Hayne - Flat-leaved Bladderwort

LILIACEAE (Lily Family)

Lilium philadelphicum L. var. *andinum* (Nutt.) Ker. - Western Red Wood Lily

Lilium philadelphicum L. var. *andinum* (Nutt.) Ker forma *immaculatum* Raup - Immaculate Yellow Lily. (R)

Maianthemum canadense Desf. var. *interius* Fern. - Two-leaved Solomon's-seal

Smilacina trifolia (L.) Desf. - Three-leaved Solomon's-seal

LORANTHACEAE (Mistletoe Family)

Arceuthobium americanum Nutt. - Pine or American Mistletoe

LYCOPODIACEAE (Club-moss Family)

Lycopodium annotinum L. - Stiff Club-moss

Lycopodium clavatum L. - Running Club-moss

Lycopodium complanatum L. - Ground-cedar; Trailing Club-moss

Lycopodium dendroideum Michx. - Ground-pine; Tree Club-moss

MYRICACEAE (Bayberry Family)

Myrica gale L. - Sweet Gale; Bog-myrtle

NYMPHACEAE (Water Lily Family)

Nuphar variegatum Engelm. - Yellow Pond-lily

ONAGRACEAE (Evening-primrose Family)

Circaea alpina L. - Small Enchanter's-nightshade

Epilobium angustifolium L. - Fireweed

Epilobium ciliatum Raf. - Northern Willow-herb

Epilobium palustre L. - Marsh Willow-herb

ORCHIDACEAE (Orchid Family)

Cypripedium acaule Ait. - Stemless Lady's-slipper

Cypripedium calceolus L. var. *parviflorum* (Salisb.) Fern. - Small Yellow Lady's-slipper

Goodyera repens (L.) R. Br. - Lesser Rattlesnake Plantain

Platanthera hyperborea (L.) Lindl. - Northern Green Bog Orchid

Platanthera obtusata (Banks) Lindl. - Small Northern Bog Orchid

Spiranthes romanzoffiana Cham. & Schl. - Hooded Ladies'-tresses

PINACEAE (Pine Family)

Abies balsamea (L.) Mill. - Balsam Fir

Larix laricina (Du Roi) K. Koch - Tamarack; American Larch

Picea glauca (Moench) Voss - White Spruce

Picea mariana (Mill.) BSP. - Black Spruce

Pinus banksiana Lamb. - Jack Pine

PLANTAGINACEAE (Plantain Family)

Plantago major L. - Common or Broadleaf Plantain; White-man's Foot*

POACEAE (Grass Family)
Agropyron trachycaulum (Link) Malte - Slender or Western Wheatgrass
Agrostis scabra Willd. - Rough Hair-grass; Tickle-grass
Alopecurus aequalis Sobol. - Short-awned or Water Foxtail
Calamagrostis canadensis (Michx.) Beauv. - Blue Joint; Marsh Reed Grass
Elymus innovatus Beal. - Hairy Wild-rye
Glyceria borealis (Nash) Batch. - Northern Manna Grass
Festuca saximontana Rydb. - Rocky Mountain Fescue
Hierochloe odorata (L.) Beauv. - Sweet Grass
Oryzopsis asperifolia Michx. - White-grained Mountain-rice
Oryzopsis pungens (Torr.) Hitch. - Slender Mountain-rice
Phalaris arundinacea L. - Reed Canary Grass
Phragmites australis (Cav.) Trin. - Common Reed Grass
Poa arctica R.Br. - Arctic Blue Grass. (R)
Poa interior Rydb. - Inland or Woodland Blue Grass
Poa palustris L. - Fowl Blue Grass
Schizachne purpurascens (Torr.) Swallen - Purple Oat-grass

POLYGONACEAE (Buckwheat Family)
Polygonum amphibium L. var. *stipulaceum* (Coleman) Fern. var. *hirtuosum* (Farw.) Fern. - Water or Swamp Persicaria or Smart-weed
Polygonum cilinode Michx. - Fringed Black Bindweed
Polygonum punctatum Ell. var. *confertiflorum* (Meisn.) Fassett - Dotted Water Smartweed. (R)
Rumex triangulivalvis (Dans.) Rech. f. - Willow-leaved or Mexican Dock

POLYPODIACEAE (Polypody Family)
Polypodium virginianum L. - Common or Virginia Polypody; Common Rock-tripe

POTAMOGETONACEAE (Pondweed Family)
Potamogeton gramineus L. - Grass-leaved Pondweed
Potamogeton natans L. - Common Floating Pondweed
Potamogeton pusillus L. - Small Pondweed
Potamogeton richardsonii (Benn.) Rydb
Potamogeton zosteriformis Fern. - Eel-grass Pondweed

PRIMULACEAE (Primrose Family)
Lysimachia thyrsiflora L. - Tufted Loosestrife
Trientalis borealis Raf. - Northern Star Flower

PYROLACEAE (Wintergreen Family)
Chimaphila umbellata (L.) Bart. - Prince's-pine
Moneses uniflora (L.) A. Gray - One-flowered Wintergreen
Orthilia secunda (L.) House - One-sided Wintergreen or Pyrola
Pyrola asarifolia Michx. - Pink Wintergreen or Pyrola
Pyrola elliptica Nutt. - Common Shinleaf
Pyrola virens Schweig. - Green-flowered Wintergreen or Pyrola

RANUNCULACEAE (Buttercup Family)
Actaea rubra (Ait.) Willd. forma *neglecta* (Gilman) Robins - White Baneberry
Caltha natans Pall. - Floating Marsh Marigold
Caltha palustris L. - Marsh-marigold
Pulsatilla ludoviciana (Nutt.) Heller - Crocus Anemone; Pasque-flower; Prairie-crocus
Ranunculus flammula L. - Creeping Spearwort
Ranunculus gmelinii DC. - Small Yellow Watercrowfoot
Ranunculus lapponicus L. - Lapland

Buttercup

Ranunculus pensylvanicus L. f. - Bristly Buttercup

ROSACEAE (Rose Family)

Amelanchier alnifolia Nutt. - Saskatoon Serviceberry

Fragaria glauca (S. Wats.) Rydb. - Smooth Wild Strawberry

Geum aleppicum Jacq. - Yellow Avens

Potentilla norvegica L. - Rough Cinquefoil

Potentilla palustris (L.) Scop. - Marsh Cinquefoil

Potentilla pensylvanica L. var. *pensylvanica* - Prairie or Pennsylvania Cinquefoil

Prunus pensylvanica L. f. - Pin Cherry; Bird Cherry

Rosa acicularis Lindl. ssp. *sayi* (Schwein.) Lewis - Prickly Wild Rose

Rosa woodsii Lindl. - Wood's Wild Rose

Rubus idaeus L. var. *strigosus* (Michx.) Maxim. - Wild Red or Canada Raspberry

Rubus pubescens Raf. - Dewberry; Bramble; Running Raspberry

RUBIACEAE (Madder Family)

Galium boreale L. - Northern Bedstraw

Galium trifidum L. - Small Bedstraw

Galium triflorum Michx. - Sweet-scented Bedstraw

SALICACEAE (Willow Family)

Populus balsamifera L. - Balsam or Black Poplar

Populus tremuloides Michx. - Trembling Aspen; White Poplar

Salix pedicellaris Anderss. - Bog Willow

Salix petiolaris J.E. Smith - Basket Willow

Salix planifolia Pursh - Flat-leaved Willow

Salix pyrifolia Anderss. - Balsam or Pear-leaved Willow

SANTALACEAE (Sandalwood Family)

Comandra umbellata A. DC. var *umbellata* - Common Comandra; Bastard Toad-flax

Geocaulon lividum (Richards.) Fern. - Northern Comandra

SAXIFRAGACEAE (Saxifrage Family)

Heuchera richardsonii R. Br. - Richardson's Alum-root

Mitella nuda L. - Mitrewort; Bishop's-cap

Parnassia palustris L. - Northern Grass-of-Parnassus

Saxifraga tricuspidata Rottb. - Three-toothed Saxifrage

SCROPHULARIACEAE (Figwort Family)

Melampyrum lineare Desv. - Cow-wheat

SPARGANIACEAE (Bur-reed Family)

Sparganium angustifolium Michx. - Narrow-leaved Bur-reed

Sparganium eurycarpum Engelm. - Broad-fruited Bur-reed

TYPHACEAE (Cat-tail Family)

Typha latifolia L. - Cat-tail

VIOLACEAE (Violet Family)

Viola adunca J.E. Smith - Early Blue or Hooked-spur Violet

Viola palustris L. - Marsh Violet

Viola renifolia Gray var. *brainerdii* (Greene) Fern. - Kidney-leaved Violet

(Voucher specimens are filed in the W.P. Fraser Herbarium, University of Saskatchewan, Saskatoon, Saskatchewan.)

MIDGES

ADDITIONS AND CORRECTIONS TO THE LIST OF NON-BITING MIDGES IN SASKATCHEWAN

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Since publication of the list of chironomids known to occur in Saskatchewan in "An amateur naturalist's guide to non-biting midges in Saskatchewan"[1], 69 additional species have been found to occur in the province (Table 1).[2,3,4,5] This brings the total number of species to 190. Several names have been synonomized (i.e., the names were used for species thought to be new but found to be previously described). Also, a number of typographical errors appeared in the original list during typesetting and are corrected here (Table 2).

The total number of named species now stands at 169. Twenty-one additional species have not yet been assigned a name. Many of the species listed for North America have distributions in Alberta and Manitoba, and it is probable that they also occur in Saskatchewan but have yet to be discovered.[4] The 190 species make chironomids the most diverse aquatic insect group in Saskatchewan. They also represent about 10% of the 2,000 species thought to occur in North America (the Nearctic) and about 4% of the estimated 5,000 species worldwide.[4]

1. MASON, P.G., D.W. PARKER and P. MORRILL. 1991. An amateur naturalist's guide to non-biting midges in Saskatchewan. *Blue Jay* 49:174-182.

2. DOSDALL, L.M. and P.G. MASON. 1981. A chironomid (*Nanocladius* (*Plecopteracoluthus*) *branchicolus*: Diptera) phoretic on a stonefly (*Acroneuria lycorias*: Plecoptera) in Saskatchewan. *Can. Ent.* 113:141-147.

3. MASON, P.G. 1986. The larvae and pupae of *Stictochironomus marmoreus* and *S. quagga* (Diptera: Chironomidae). *Can. Ent.* 117:43-48.

4. OLIVER, D.R., M.E. DILLON and P.S. CRANSTON. 1990. A catalogue of Nearctic Chironomidae. Ag. Can. Publ. 1857/B. 89 pp.

5. PARKER, D.W. 1992. Emergence phenologies and patterns of aquatic insects inhabiting a prairie pond. Ph.D. thesis, Department of Biology, University of Saskatchewan. 173 pp.

* * *

Maximum butterfly longevity: Cabbage Butterfly: 3 days for female/17 for male; tiger Swallowtail, 3/12; Spring Azure, 4/2; Orange Sulphur, 14/25; Viceroy, -/17; Great Spangled Fritillary, -/22. *Paul Opler and George Krizek, Butterflies East of the Great Plains.*

Table. 1. ADDITIONS TO THE CHIRONOMIDAE KNOWN TO OCCUR IN SASKATCHEWAN.

Podonominae
- **Boreochlini**
  - *Boreochlus persimilis* (Johannsen)*
  - *Lasiodiamesa rawsoni* Brundin*
- **Podonomini**
  - *Parochlus kiefferi* (Garrett)*

Tanypodinae
- **Coelotanypodini**
  - *Clinotanypus* (Clinotanypus) sp.
- **Macropelopiini**
  - *Apsectrotanypus johnsoni* (Coquillett)*
  - *Macropelopia decedens* (Walker)*
- **Pentaneurini**
  - *Ablabesmyia (Ablabesmyia) aspera* (Roback)*
  - *Ablabesmyia (Asayia) annulata* (Say)*
  - *Conchapelopia fasciata* Beck & Beck*
  - *Conchapelopia pallens* (Coquillett)*
  - *Guttipelopia rosenbergi* Bilyj
  - *Helopelopia cornuticaudata* (Walley)*
  - *Labrundinia pilosella* (Loew)*
  - *Larsia canadensis* Bilyj*
  - *Meropelopia flavifrons* (Johannsen)*
  - *Paramerina fragilis* (Walley)*
  - *Zavrelimyia sinuosa* (Coquillett)*
- **Procladiini**
  - *Procladius (Holotanypus) culiciformis* (L.)*
  - *Procladius (Holotanypus) dentus* Roback*
  - *Procladius (Holotanypus) ruris* Roback*

Prodiamesinae
- *Monodiamesa* sp.

Orthocladiinae
- *Acricotopus lucens* (Zetterstedt)
- *Brillia flavifrons* (Johannsen)*
- *Corynoneura scutellata* Winnertz*
- *Cricotopus (Cricotopus) cylindraceus* (Kieffer & Thiennemann)
- *Cricotopus (Cricotopus) flavocinctus* (Kieffer)
- *Cricotopus (Cricotopus) tremulus* (L.)*
- *Cricotopus (Isocladius) pilitarsus* (Zetterstedt)*
- *Cricotopus brunnicans* (Walley)*
- *Heterotrissocladius changi* Saether*
- *Heterotrissocladius oliveri* Saether*
- *Mesosmittia acutistylus* Saether
- *Nanocladius (Nanocladius) distinctus* (Malloch)*
- *Nanocladius (Plecopteracoluthus) branchicolus* Saether
- *Orthocladius (Euorthocladius) rivulorum* Kieffer*
- *Orthocladius (Orthocladius) smolandicus* Brundin
- *Orthocladius (Symposiocladius) lignicola* Kieffer
- *Parakiefferiella subaterrima* (Malloch)*
- *Parametriocnemus lundbeckii* (Johannsen)*
- *Psectrocladius (Psectrocladius) barbimanus* (Edwards)*

Chironominae

Chironomini

- *Beckidia tethys* (Townes)
- *Chironomus (Camptochironomus) pallidivittatus* Malloch*
- *Chironomus (Chironomus) hyperboreus* Staeger*
- *Chironomus (Chironomus) utahensis* Malloch*
- *Cryptochironomus blarina* Townes*
- *Dicrotendipes lucifer* (Johannsen)*
- *Dicrotendipes tritomus* (Kieffer)*
- *Endochironomus subtendens* (Townes)*
- *Glyptotendipes amplus* Townes*
- *Glyptotendipes dreisbachi* Townes*
- *Glyptotendipes unacus* Townes*
- *Kiefferulus (Kiefferulus) dux* (Johannsen)*
- *Pagastiella ostansa* (Webb)*
- *Parachironomus forceps* (Townes)
- *Parachironomus monochromus* (Wulp)*
- *Parachironomus varus* (Goetghebuer)
- *Phaenopsectra punctipes* (Wiederholm)*
- *Polypedilum (Polypedilum) nubeculosum* (Meigen)*
- *Sergentia (Sergentia) coracina* (Zetterstedt)*
- *Stictochironomus marmoreus* (Townes)
- *Stictochironomus quagga* (Townes)
- *Stictochironomus rosenschoeldi* (Zetterstedt)*

Pseudochironomini

- *Pseudochironomus middlekauffi* Townes

Tanytarsini

- *Micropsectra connexa* (Kieffer)*
- *Paratanytarsus kaszabi* group
- *Paratanytarsus tenuis* group
- *Stempellinella* sp.
- *Tanytarsus buckleyi* Sublette
- *Tanytarsus* cf. *mendax* (Kieffer)

* from Oliver *et al.* (1990)[4]

Fungus *Blake Maybank*

Table 2. CORRECTIONS TO THE CHIRONOMIDAE KNOWN TO OCCUR IN SASKATCHEWAN.

Tanypodinae

Macropelopiini

Derotanypus alaskensis (Malloch) was incorrectly assigned to Pentaneurini
Psectrotanypus dyari (Coquillett) was incorrectly assigned to Procladiini

Pentaneurini

Ablabesmyia (Karelia) illinoense (Malloch) should read *Ablabesmyia (Karelia) illinoensis* (Malloch)

Procladiini

Procladius (Procladius) denticulatus Sublette should read *Procladius (Halocladius) denticulatus* Sublette
Procladius (Procladius) freemani Sublette should read *Procladius (Halocladius) freemani* Sublette

Diamesinae

Diamesini

Diamesa cineralla Meigen should read *Diamesa* cf. *cinerella* Meigen

Orthocladiinae

Acricotopus senex (Johannsen) is now a junior synonym of *Acricotopus nitidellus* (Malloch)
Cricotopus (Cricotopus) bicintus (Meigen) should read *Cricotopus (Cricotopus) bicinctus* (Meigen)
Cricotopus (Cricotopus) curtuss Jirvenjo should read *Cricotopus (Cricotopus) curtus* Hirvenoja
Cricotupus (Isocladius) intersectus (Staeger) should read *Cricotopus (Isocladius) intersectus* (Staeger)
Cricotupus (Isocladius) ornatus (Meigen) should read *Cricotopus (Isocladius) ornatus* (Meigen)
Cricotupus (Isocladius) sylvestris (Fabricius) should read *Cricotopus (Isocladius) sylvestris* (Fabricius)
Nanocladius (Nanocladius) crassocornis Saether should read *Nanocladius (Nanocladius) crassicornis* Saether
Orthocladius (Orthocladius) obrumbatus Johannsen should read *Orthocladius (Orthocladius) obumbatus* Johannsen
Parakiefferiella (Parakiefferiella) tortulata Saether is now a junior synonym of *Parakiefferiella (Parakiefferiella) subaterrima* (Malloch)
Psectrocladius (Allosectrocladius) flavus (Johannsen) should read *Psectrocladius (Allopsectrocladius) flavus* (Johannsen)
Psectrocladius (Psectrocaldius) flavus (Johannsen) should read *Psectrocladius (Psectrocladius) flavus* (Johannsen)

Chironominae

Chironomini

Cladopelma viridulus (Linnaeus) should read *Cladopelma viridula* (Linnaeus)
Cryptochironomus stylifera Johannsen is now a junior synonym of *Cryptochironomus psittacinus* Meigen
Cryptotendipes casuaris (Townes) should read *Cryptotendipes casuarius* (Townes)
Polypedilum (Polypedilum) obtusum Townes is now a junior synonym of *Polypedilum (Polypedilum) convictum* (Walker)
Polypedilum (Tripodura) digitifer Townes is now a junior synonym of *Polypedilum (Tripodura) halterale* (Coquillett)
Stenochironomus hilarus (Walker) should read *Stenochironomus hilaris* (Walker)
Xenochironomus (Anceus) scopulus Townes is now known as *Axarius scopula* (Townes)

Tanytarsini

Micropsectra polits (Malloch) should read *Micropsectra polita* (Malloch)
Paratanytarsus confusus Palmen is now a junior synonym of *Paratanytarsus dissimilis* (Johannsen)

BIRDS

BURROWING MITES THAT PESTER BIRDS

WILLIAM J. VAN SCHEIK, Canadian Union College, College Heights, Alberta.
T0C 0Z0

The subzero winter temperatures of southern Alberta bring flocks of birds to fuel up on sunflowers seeds and suet at the feeder. As I watch them eating and bickering, I spot an Evening Grosbeak. It catches my attention because its legs and feet are heavily encrusted with scale, leaving them marginally functional. Closer inspection of this flock reveals more than 20% have some degree of scale. Though well known to poultry farmers and cage bird breeders, scaly-leg is seen only infrequently in wild birds. Scaly-leg is caused by one of the many species of mites that choose our feathered friends as hosts.

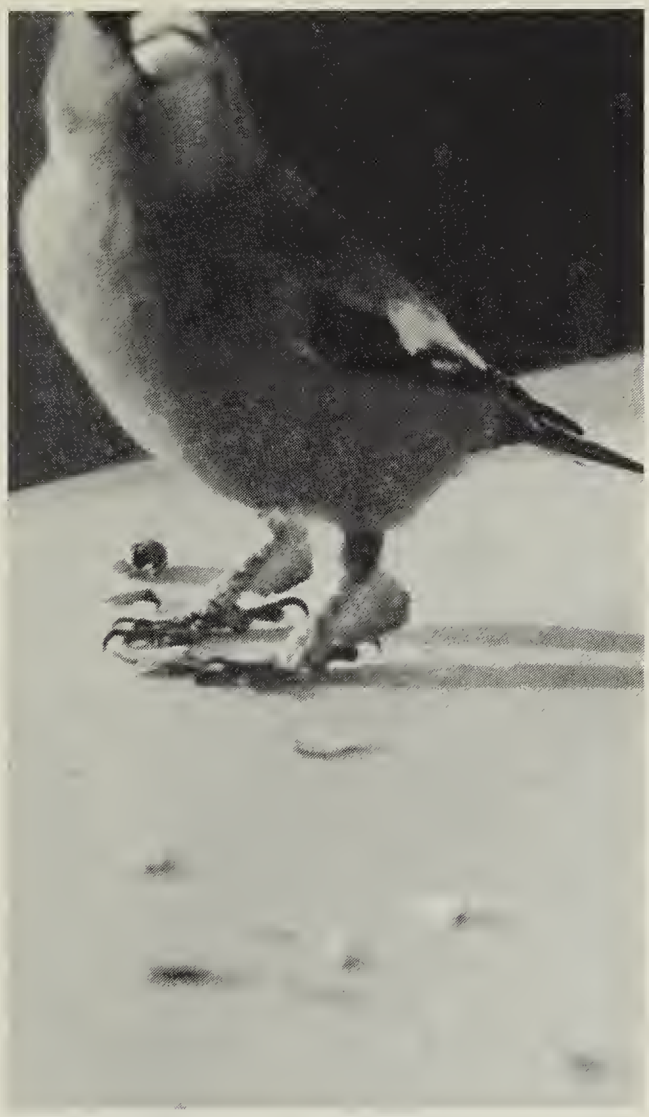
Mites, the smallest of arthropods (relatives of ticks and spiders), have a diversity equalled only by insects. These near-microscopic organisms have adapted to life on or in birds, insects and mammals, including man. Mange in dogs and scabies in man are manifestations of the presence of mites.

Most of the birds I observe are infested with mites. Some mites are so specific as to be found only on a single species of bird. One species of *Rhinoecius* is found only in the nasal passages of owls. Other species are restricted to single families of birds, such as Charadriiformes (shorebirds, gulls and auks). Several species of mites are endoparasitic and burrow under the skin or wander freely on or in air sacs, thoracic cavities, lungs or just about anywhere in the body cavity.

You may find mites in recently abandoned nests. Mites hiding in nesting material emerge to suck blood of incubating or brooding adults, or of hatchlings. Large numbers of nest mites on hatchlings can result in reduced growth rates, anaemia or even death. In some cases, adult birds have been sufficiently irritated by mites that incubation and brooding have been interrupted with resultant reproductive failure. The ubiquitous Northern Fowl Mite infests a large number of wild species and is an especially voracious blood feeder.

Check carefully among the feathers of birds you pick up. Feather mites live and feed on feathers and the horny layers of a bird's skin, but tend to avoid wing feathers. Apparently these mites have little effect on the host bird. Some species take up residence around the feather bases and burrow into the shafts. The resulting intense irritation may cause the host to pull feathers. This disrupts thermoregulation and may cause death due to hypothermia.

The scaly-leg on the Evening Grosbeak I saw is caused by the mite *Cnemidocoptes mutant*, indistinguishable from the scaly-leg mite familiar to poultry farmers. Although apparently the same species, there is no evidence that mites are spread between wild species and domestic flocks. A disease with essentially the same symptoms occurs in budgerigars and is caused by a closely related species, *C. piloe*.



Evening Grosbeak with scaly-leg

H. Shultz

The first signs of infestation appear as a wart-like growth on the skin on the leg, cere or beak. In wild birds only the feet and legs are involved. Encrustations are caused by the burrowing of mites into the epithelial skin layers. Tissue proliferation is stimulated, resulting in scaling and hyperkeratosis (an overgrowth of tissue). Tunnels in the tissue contain adult mites and larvae. It seems likely that the parasite completes its life cycle on the host. Even in extremely heavy infestations, there is never evidence of inflammatory reaction.

Scaly-leg involves only the feet and legs. Birds with severe infestations may have shanks many times the normal diameter. Some birds I have observed have lost toes to the mites. In other birds, the disease has left the feet virtually dysfunctional, and such birds are seriously disadvantaged in foraging at feeding stations.

I carefully removed mites from a heavily infested male Evening Grosbeak. It's a good idea not to permit contact with the skin as mites are known to use humans as hosts. Female mites are spherical in shape, about 0.5 mm in diameter, with four short legs. Males are less than half that size but with longer legs. The head and thorax are fused together as in spiders and other arachnids.

Transmission between mature birds by contact has been difficult to demonstrate. The primary mode of transmission appears to be from parent to offspring during the nesting period. Direct contact, allowing infection, occurs during brooding and feeding of nestlings. Perhaps infected members of a flock are closely related.

The relatively large amount of time birds spend in maintenance activity may be necessary to keep mite populations in check. Preening, dust and water baths likely reduce the number of resident parasites. Anting (rubbing ants among the feathers) has been observed in 150 species of birds. Ornithologists believe that the formic acid produced by the ants may be used by birds as a mite repellent.

Scaly-leg, though not common in wild species, has been reported in House Sparrows, Cassin's Finches, Evening Grosbeaks, White-breasted Nuthatches, Red-winged Blackbirds, Common Grackles, Brown-headed Cowbirds, Black-capped Chickadees, and Crested Flycatchers. Watch for evidence of mites when you go bird watching. You might find new names to add to the list of infected species.

DISTANT TRAVELS OF TREE SWALLOWS OF THE PRAIRIE PROVINCES, 1968-1992

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The small sample of banding recoveries obtained to date suggests that Tree Swallows from Alberta and Saskatchewan follow a consistent and relatively narrow path of migration from the Canadian prairies to the Gulf coast and southern Atlantic coast, where some of them winter. If one were to draw a line from each banding point to the corresponding recovery point, assuming that the swallows followed a reasonably straight line, the lines representing those banded near Edmonton would become confused with lines from banding points along the Saskatoon and Indian Head banding trails, resulting in a confusing mesh of inseparable, nearly parallel lines. For this reason we deleted such lines from Figure 1.

To obtain the 26 out-of-province recoveries reported (Figure 1 and Table 1), it was necessary to band a prodigious number of swallows, about 55,000 over 25 years. For example, from 11,789 Tree Swallows banded near Saskatoon, 1968-1991, Mary Houston has had 28 recoveries to date, a rate of only 0.002% (two per thousand), including seven recoveries from beyond Saskatchewan.[2] Before 1987, published distant recoveries from the Saskatoon area were all of birds banded as nestlings; three were in North Dakota and one at Somerset, Manitoba, all four in August.[2] Of the 11,600 swallows he banded near Indian Head, Saskatchewan, Lorne Scott had one found dead in North Dakota two months after banding and one shot in Minnesota one year later, respectively.[2] Alberta banding of this species has included 10,351 swallows banded by Erhard (Hardy) Pletz of Edmonton; 8,794 by J. Cam Finlay; 5,684 by Don Stiles of Calgary and his subpermittees; 2,700 by the Beaverhills Bird Observatory; 2,084 by Edgar T. Jones; 1,430 by Helen Trefry; and 800 by Robert E. Danner. This paper is the first comprehensive report of recoveries from the extensive banding effort in Alberta, and adds three more distant recoveries to the list of swallows banded in Saskatchewan.

Results The Tree Swallow migration for both immatures (22) and adults (4) follows the common and expected southeasterly route for most small birds from Alberta and Saskatchewan, but the plotted course is a surprisingly consistent arc between 110° and 139° southeasterly for Alberta swallows and between 113° and 150° for Saskatchewan swallows (Figure 1 and Table 2). Six of the 11 direct recoveries had an almost identical course of between 110° and 117° southeast, and 7 of the 14 recovered in subsequent years followed a similar course of between 112° and 119°. Seven, with a Manitoba swallow, ended up in the northeast corner of North Dakota. Only five swallows, those destined

Tree Swallow at nest *John Lowe*

for Missouri, Mississippi and Louisiana (three originating from Alberta locations closer to Calgary and two from Saskatoon), deviated a relatively few degrees more to the south, four of them reaching the strip of coastline where relatively few swallows remain through the winter. Two other swallows reached the easternmost portion of this coast in southeastern South Carolina and Georgia. The five from Alberta all travelled more than 3,000 km and the one from Saskatchewan over 2,600 km (Table 2).

Although many adult swallows return to use the same or a nearby nest box, recoveries of two swallows banded as breeding adults reveal surprisingly long distances between the nesting site in a given year and that of a subsequent year.[2] This suggests that some individuals at least use nest sites at a considerable distance from those occupied previously. One swallow, killed by a car in North Dakota in early June, was 1,085 km from its Edmonton area nesting site where it had been banded as a breeding adult by Cam Finlay almost exactly one year earlier. Another breeding swallow banded by Robert Taylor at Delta, Manitoba was a “wrong-way Corrigan”; it followed the flight corridor but in the opposite direction from a nest box near Delta, Manitoba, to another near Spy Hill, Saskatchewan, a dispersal of 265 km over two years.

Even more dramatic were the distances between the nests in which two swallows were raised and the boxes in which they in turn raised offspring. A swallow that was fledged in the Edmonton area, banded by Cam Finlay, was caught nesting in a box in Wisconsin four years later, a dispersal of 1,965 km. An Edmonton area swallow banded by Hardy Pletz was shot with a BB gun pellet the next June in North Dakota, 1,125 km to the southeast of where it was raised.

Other individual swallows are of special interest because of evidence about the locations reached by a given date in the year of banding. A nestling swallow banded on 27 June by Helen Trefry near Wainwright, Alberta, flew to Minnesota by 6 August. An adult female swallow, banded by Edgar Jones at the bird’s nest box in Alberta on the last day of May, reached Minnesota by 4 August. A nestling Saskatchewan swallow banded by Mary Houston on 2 July reached Missouri by 2 September.

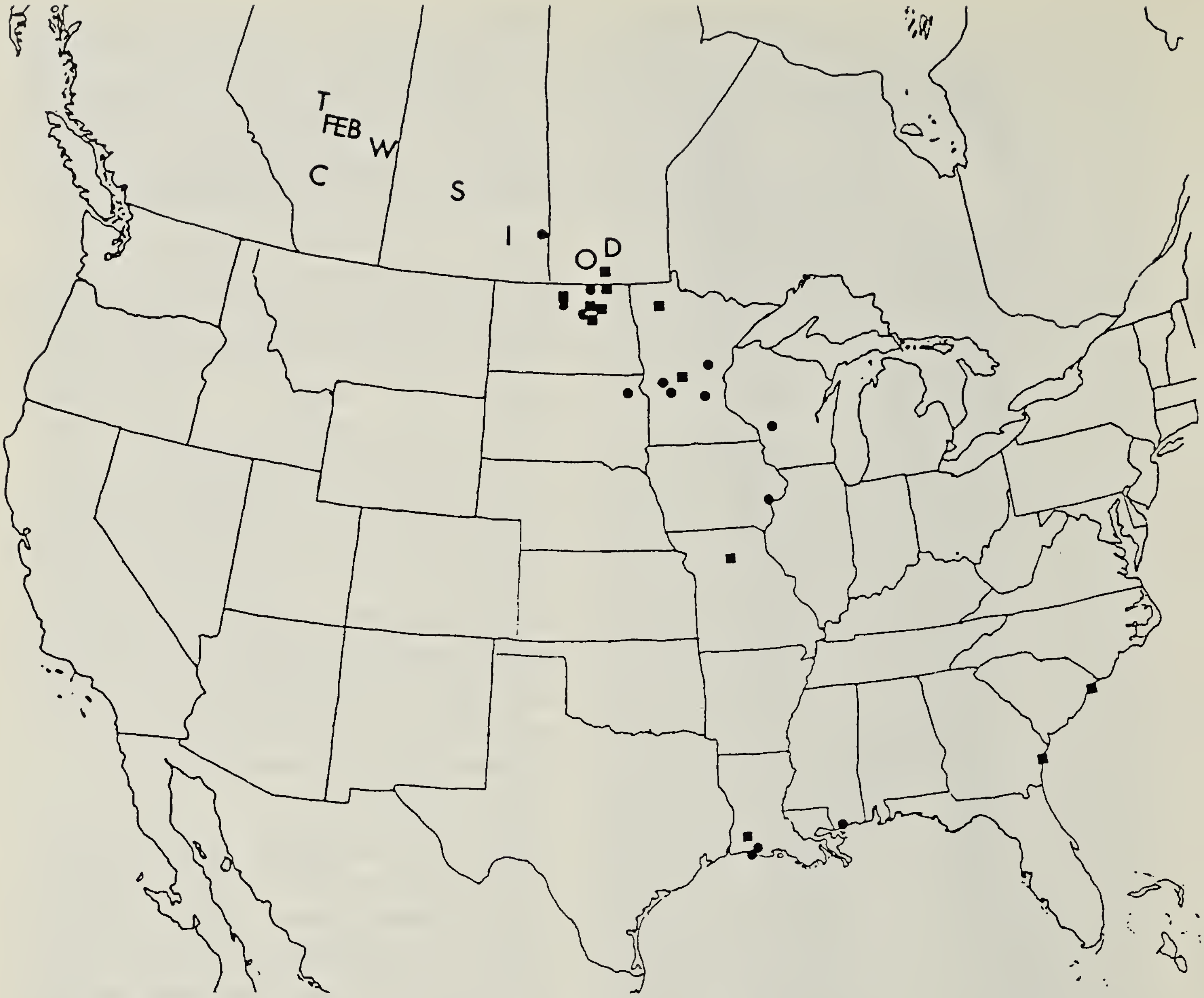

Figure 1: ■ - direct recoveries, same year as banded. ● - indirect recoveries, in subsequent years. Banding localities: B - Beaverhill Lake, Alberta; C - Calgary, Alberta; D - Delta, Manitoba; E - Edmonton, Alberta; F - Fort White Earth, Alberta; I - Indian Head, Saskatchewan; O - Oak Lake, Manitoba; S - Saskatoon, Saskatchewan; T - Thunder Lake, Alberta; W - Wainwright, Alberta.

Of equal interest is the manner of recovery of the 26 swallows recovered outside the province where they were banded. Ten were found dead with no obvious cause of death; one dropped dead in the sight of ecology professor Stuart Pimm and his students on a field course at Sapelo, Georgia, where the sand dunes were covered by tens of thousands of exhausted and perhaps starving Tree Swallows on their way north on 15 March. Elsewhere, three swallows were shot and killed by boys with pellet guns, two were caught by a dog and one by a cat. Two were injured, two (mentioned above) were caught alive in a far distant nest box, one was killed by a car, another was temporarily tangled in a twig and one was killed by a power transmission line. One swallow met its death in a more dramatic manner. A nestling, 2021-67115, banded in Blackstrap Causeway box 26 in a brood of six by Mary Houston on 3 July 1989, was killed by an airplane at Lake Charles Regional Airport, Lake Charles, Louisiana, 18 December 1989, 2,635 km away.

Even more noteworthy were the bands from two swallows found during a Barn Owl pellet study by Jennifer Coulson (pers. comm.) at the Rockefeller Wildlife Refuge, on

Table 1. TREE SWALLOWS BANDED IN THE PRAIRIE PROVINCES AND RECOVERED IN A DIFFERENT STATE OR PROVINCE.

	Banded in			
	Alberta	Saskatchewan	Manitoba	Total
Recovered in				
Georgia	1			1
Iowa		1		1
Louisiana	2	1		3
Manitoba		1		1
Minnesota	5	1		6
Mississippi	1			1
Missouri		1		1
North Dakota	3	4	1	8
Saskatchewan			1	1
South Carolina	1			1
South Dakota	1			1
Wisconsin	1			1
Total	15	9	2	26

the southwest coast of Louisiana near Grand Chenier. The first, 2010-91554, a nestling in a brood of seven, was banded 13 mi. east and 2 mi. north of Didsbury, Alberta, by Donald Stiles on 25 June 1988; the band was found in a Barn Owl pellet on 23 August 1991. Another, 2061-53259, was banded near Edmonton by R.E. Danner on 1 July 1989; the band was recovered in a pellet analyzed on 28 July 1992. There is no estimate of when either pellet had been coughed up, but in her study Coulson found skeletons of 544 vertebrates, including 344 birds, of which 18 were Tree Swallows. One suspects that both swallows were captured by the owl and the pellet regurgitated much earlier in the year, perhaps while the swallows were roosting in early spring.

Discussion Butler's 1988 review of all North American banding of Tree Swallows noted that there had been only 293 recoveries from banding of 802,662 across North America, or 0.0003%, three from every 10,000 banded. Of these, only 41 recoveries were outside the breeding season and more than 120 km from the banding site.[1] Butler's oversimplified map depicts a single banding site in Alberta with a recovery in South Carolina, and a Saskatchewan-banded recovery in Minnesota, but his legend states that "Some symbols represent more than one banding location and recovery site." Butler's statement, from evidence to date, that "Swallows from the Canadian prairies ... appear to migrate mostly along the Mississippi River Valley to their winter quarters in the southern USA and Central America," is a surmise based on extrapolation. Two of our swallows moved, directly or indirectly, east of the Mississippi to the Atlantic coast. Surprisingly, there is as yet no record of a banded swallow from the prairie provinces being recovered in the presumed main wintering areas of Mexico and Central America.[3]

One of the largest Tree Swallow staging areas in Louisiana is near Edgard, west of New Orleans, where a million or more Tree Swallows congregate from late November to early December at a sugar mill before

Table 2. **OUT-OF-PROVINCE RECOVERIES OF TREE SWALLOWS BANDED IN PRAIRIE PROVINCES, 1965-1992**

Banding						
			Where Banded			**When**
Bander	**Band No.**	**Age***	**Lat.**	**Long.**	**** Loc.**	**Date (y/m/d)**
Alberta						
E.T. Jones	0800-15555	AdF	53.2	113.0	E	72/05/31
E.T. Jones	2021-62657	L	53.2	112.5	E	89/06/30
J.C. Finlay	1041-85067	L	54.0	114.4	T	73/07/01
J.C. Finlay	0820-27269	L	53.2	113.1	E	75/06/24
J.C. Finlay	0880-26155	L	53.0	113.4	E	77/07/09
J.C. Finlay	0890-49655	AdF	53.2	114.1	F	80/06/12
J.C. Finlay	0890-49857	L	53.1	113.3	E	80/07/04
H. Trefry	0940-13050	L	52.5	110.5	W	85/06/27
H. Trefry	2011-78554	L	52.5	111.0	W	87/07/02
E. Pletz	0980-29944	L	53.3	113.2	E	85/06/20
E. Pletz	2051-98045	L	53.3	113.2	E	87/06/24
D.J. Stiles	2010-91554	L	51.4	113.4	C	88/06/25
D.J. Stiles	2031-62019	AdF	51.2	114.2	C	90/06/30
Beaverhill Obs.	2061-50071	L	53.2	112.3	B	89/07/03
R.E. Danner	2061-53259	L	53.1	113.4	E	89/07/01
Saskatchewan						
R.L. Scott	0730-04491	L	50.2	103.2	I	69/07/06
R.L. Scott	0830-08363	L	50.3	104.0	I	75/06/27
M.I. Houston	0830-11930	L	51.5	106.3	S	75/06/29
M.I. Houston	0830-17273	L	51.5	106.4	S	76/06/21
M.I. Houston	0880-41966	L	51.5	106.4	S	77/07/08
M.I. Houston	2000-06162	L	51.4	106.2	S	84/06/30
M.I. Houston	2010-88374	L	51.5	106.3	S	85/06/25
M.I. Houston	2011-85001	L	51.5	106.4	S	87/07/02
M.I. Houston	2021-67115	L	51.4	106.2	S	89/07/03
Manitoba						
R.R. Taylor	0520-49136	AdU	50.1	98.1	D	58/07/27
D.R. Hatch	1080-63570	L	49.4	100.3	O	69/06/21

*Age
L - Local, unable to fly
AdF - Adult female
AdU - Adult, sex unknown

**Localities (Loc.) where banded (see map)
B - Beaverhill Lake, Alberta
C - Calgary, Alberta
D - Delta, Manitoba
E - Edmonton, Alberta
F - Fort White Earth, Alberta
I - Indian Head, Saskatchewan
O - Oak Lake, Manitoba
S - Saskatoon, Saskatchewan
T - Thunder Lake, Alberta
W - Wainwright, Alberta

Table 2 (continued)

Recoveries						
Where Recovered			When	How	Distance from banding site	Direction
Lat.	Long.	*** Loc.	Date (y/m/d)	****	(km)	(degrees)
45.4	94.5	MN	72/08/04	00	1560	SE 116
46.0	93.3	MN	90/08/20	00	1605	SE 113
33.3	78.5	SC-w	73/10/31	57	3610	SE 115
45.1	95.2	MN	79/08/04	00	1575	SE 118
48.3	100.4	ND	77/08/08	00	1040	SE 114
48.3	100.4	ND	81/06/08	14	1085	SE 114
44.0	90.3	WI	84/06/18	88	1965	SE 113
48.1	95.5	MN	85/08/06	00	1180	SE 110
30.1	89.1	MS-w	91/11/09	00	3085	SE 136
48.4	99.1	ND	86/06/04	01	1125	SE 113
31.2	81.1	GA-w	88/03/16	00	3560	SE 121
29.4	92.4	LA-w	91/08/23	09	3000	SE 137
45.1	97.3	SD	92/07/28	01	1420	SE 112
45.3	95.4	MN	90/06/28	12	1495	SE 119
29.4	92.4	LA-w	92/07/28	09	3125	SE 139
48.0	98.5	ND	69/09/41	00	420	SE 127
45.0	93.5	MN	76/07/23	01	975	SE 125
48.1	99.1	ND	75/08/30	03	665	SE 125
48.5	98.3	ND	76/08/12	03	670	SE 117
49.2	98.3	MB	77/08/09	54	640	SE 113
41.2	91.0	IA	87/09/09	00	1640	SE 129
47.4	99.1	ND	85/08/26	00	700	SE 129
39.3	93.0	MO	87/09/02	11	1730	SE 137
30.1	93.0	LA-w	89/12/18	39	2635	SE 150
50.3	101.5	SK	60/05/30	88	265	NW 265
48.0	99.0	ND	75/07/19	11	215	SE 149

*** - "w" means on wintering grounds

****Codes for how found
00 - found dead (10)
01 - shot (3)
03 - injured (2)
09 - killed by owl (2)
11 - caught by dog (2)
12 - caught by cat (1)
14 - killed by automobile (1)
39 - killed by airplane (1)
54 - electrocuted (1)
57 - entangled in twig, released (1)
88 - nesting (2)
(total = 26)

settling in nearby sugar cane fields each night: "About an hour before dusk ... birds begin arriving from all directions ... concentrate in a huge mass ... hovering ... a minute before they descend, the whole group begins to swirl forming two or three funnel clouds."[4] In 1978, the swallows frequented their cane field roost until mid-January but most years they leave for some unknown destination by mid-December.[4]

Acknowledgements We thank Jennifer Coulson for sharing information concerning her Barn Owl study paper; Bob Danner, G.R. Ebel, Cam Finlay, Edgar Jones, Hardy Pletz, Lorne Scott, Robert R. Taylor and Helen Trefry for permission to use their recovery data; and Ronald J. Stein for his article concerning the December roost in Louisiana. Useful criticism was provided by Margaret Belcher, Bernie Gollop, Stuart Houston, and Robert Cohen.

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* * *

Feeding birds: In the past decade, this has become a popular hobby. Contrary to popular opinion, putting out seed will not disrupt migratory patterns, reports the *Chicago Tribune*. Birds tend to go where they are supposed to be, says Steve Lewis of the U.S. Fish and Wildlife Service. *Globe and Mail. 8 March 1994.*

ERRATA

In the article "Butterflies of the Peace River region of Alberta and British Columbia" (*Blue Jay* 52:71), Table 1 (p. 87) was missing the localities for the "8" series of locations on the map. The localities are:

8a - 10 km NE of Paddle Prairie
8b - 21 km NE of Paddle Prairie
8c - La Crete Ferry
8d - 7 km NE of La Crete Ferry
8e - Buffalo fire tower, 15 km SE of Buffalo Head Prairie
8f - 10 km SW of High Level
8g - 6 km W of High Level
(no site 8h appears on the map)
8i - Fort Vermilion Bridge

RESCUE OPERATION — SWALLOWS

The last few days of April 1991 have been nice. A lot of the birds are back. I see Tree Swallows flying over Wascana Lake. On the evening of 30 April 1991, it turns cold (-2°C) and it snows. On my walk around Wascana the next day I see a few Tree Swallows huddled together on the ground. A few are flying around. As I go further on I see a few dead swallows and see a few birds on the ground by a large tree that has a triangular hole at the base. There are quite a few birds on the ground. It finally dawns on me that these birds are under stress from the cold weather. I go to the museum and tell the people there what I have seen. One staff member gets a large cardboard box and returns to the lake with me. We go to the tree where I have seen the birds. We decide to catch what birds we can and take them back to the museum for warmth. I reach into the hole at the base of the tree and start pulling swallows out and putting them in the box. I pull approximately 150 birds out of the hole. Some are dead, others alive. We check several other holes in nearby trees and rescue still more birds. We take them to the museum and release them the next day.

Did we rescue these birds? Did we help them in any way? I'm not sure. I know some smothered in the holes, as they were dead when we took them out. We couldn't feed them - how do you feed birds that eat on the wing? I think what we did was proper. We acted out of kindness and must have saved a few that would have suffocated had we not taken action. Nature seems so cruel at times, but I guess it is so that only the most fit survive.

— *Keith Barr*, 40 Richardson Crescent, Regina, Saskatchewan. S4S 4J3

Migration: Birds seem to possess uncanny skills as astronomers. Most birds migrate at night, says biologist James Gould of Princeton University. They recognize patterns of stars and the tilt and rotation of the night sky as navigation aids. *Globe and Mail. 8 March 1994.*

BIRDS THAT I THOUGHT I HAVE KNOWN

KEITH BARR, 40 Richardson Crescent, Regina, Saskatchewan. S4S 4J3

I am an avid bird watcher and photographer. I have always been interested in nature. Even as a child I knew the common birds of the area - House Sparrows, crows, magpies, robins, Red-winged Blackbirds, etc. In my adult years I became interested in photography due to my work. My then teenage son had the same interests and we would often go together to photograph birds. We were fortunate to get pictures of Whooping Cranes and of Sharp-tailed Grouse on their dancing grounds. I think that these pictures of the grouse were the start of my problem.

At work, a fellow employee was giving photography lessons to interested people. He knew that my son and I had a small collection of bird and animal slides. He asked me if I would give a lecture on wildlife photography. I accepted naively. I was showing slides to the photo class, when I got to the slides of the Sharp-tailed Grouse. It was a nice picture of a grouse that had come quite close and the picture just about filled the screen. I stated that this was a female sharp-tail that had wandered over to see what my son and I were up to. Out of the dark, from the back of the room booms a very authoritative voice, "That is not a female; that is a male. See that yellow patch above the eye. Only males have that yellow patch."

The second such incident happened in just about the same way. I was showing slides to a natural history group. I should have known better! A slide of a small colourful shorebird came on the screen. I opened my mouth and these words came forth, "This is a male Wilson's Phalarope." You guessed it. Out of the dark recesses I hear this authoritative voice say, "That is not a male. That is a female." Why can't these people come to you after the showing and quietly point out your slight misjudgement?

It is the spring of the year and my wife and I are sitting on the back patio drinking coffee. We still have our bird feeder going and are feeding the horde of local sparrows. I notice a sparrow-like bird that is different. The breast is heavily streaked and the bill is thicker. It looks like some kind of a sparrow to me. I don't want my coffee to get cold while I look it up in the bird books, so I get my camera and take a couple of pictures of it. As I cannot concentrate on two things at the same time, I drink my coffee and forget about the bird.

In the late afternoon the bird is back at the feeder. I am not doing anything at the time so now I can concentrate on the bird. I get the bird books out and I think that I have found what the bird is. It is not supposed to be here in Saskatchewan. To be sure, I go through the books three more times to see if it may be another bird that I missed. I am hesitant to identify it as a female House Finch, but it is. (See *Blue Jay*, September 1990, page 167.) I phone the

Rare Bird Alert with the identification of the bird. The Rare Bird Alert is a phone number that you can call which gives any unusual sightings of birds in the area. If you have any sightings to report, you wait until the end of the tape and then leave your message. The message is updated almost every day.

I get a couple of phone calls from people wanting to see the House Finch. Alas, it has gone. These avid bird watchers ask me to phone them should the finch return. I should end here while I have one out of three, but I never know when to quit.

Ten days later, my wife and I are sitting on the back patio drinking coffee (our favourite pastime in the spring) when I see this sparrow-type bird come to the feeder. It has a streaked breast. I immediately go to the house and phone the avid birders that the House Finch is back. I want more pictures of this rare bird so I grab my camera and go back outside. I inch towards the bird. It seems different, but I want it to be a House Finch, so a House Finch it is. I take several pictures. The bird watchers arrive; the bird is gone. I feel that the bird will be back. I have an appointment and have to leave but the bird watchers are welcome to stay and they do. On returning an hour later, only one bird watcher is left. I ask him if the bird had returned. He replied that it had. I think I hear just a hint of scorn in his voice when he tells me that it was not a House Finch but only a Pine Siskin. How was I to know? I had never seen a Pine Siskin before!

Later the same year, I am out birding by myself and I see a white bird in the water, wading about. It is the size of what I think a Snowy Egret should be. In the past I have heard of Snowy Egrets in Saskatchewan, but have never seen one. This is my first Snowy Egret. I return home and call the Rare Bird Alert as well as several birders and tell them of my find. I cannot view the bird again due to other commitments. That evening when I return home my answering machine is flashing. It has a couple of messages for me. I listen to the two messages. Was there a hint of ridicule in those authoritative voices as I was informed that the bird I had reported was not a Snowy Egret but a Little Blue Heron?

I am getting to the point that if I see a bird that is not a House Sparrow, crow or robin, I say, "There goes an L.B.B." (a little brown bird). Can you really blame me?

The Audubon Christmas Bird Count for December/92-January/93 had over 43,000 participants. Six hundred and thirty-seven species, totalling 54,000,000 birds, were found on over 1,600 counts in North America. In Central and South America, 1,405 species were found on 47 counts. *American Birds 47:478.*

CACHING BY AN IRRUPTIVE HAWK-OWL

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Red-breasted Nuthatches wintering outside their breeding range cache food.[6] This fact was previously undocumented for any irruptive species that breeds in boreal forest.[2] Northern Hawk-owls also have irruptive flights, though much less frequently and periodically than do Red-breasted Nuthatches,[2,3,9,12] and feed principally on microtine rodents rather than conifer seeds and insects.[7,10,14,15] Like other owls of the northern forest such as the Boreal Owl, Northern Hawk-owls cache food in their breeding areas.[7,8,11] Only one non-detailed report exists of a hawk-owl hiding a mouse in a dead tree in Minnesota, at a site where no breeding evidence was presented, though scattered nest records have occurred in the northern third of that state.[12] Otherwise, food caching by Northern Hawk-owls has not been documented outside their breeding range.

Isolated in the Gulf of Saint Lawrence, the Magdalen Islands are within the boreal forest and sub-arctic biomes; the extent of forest is small and the Northern Hawk-owl is a vagrant here.[4] Several records during summer 1978 suggested that the species may have nested; otherwise, only two reports exist, one from the winter of 1991-1992 when hawk-owls had a massive irruption into southern Quebec.[1] I document herein the caching of a microtine rodent by a Northern Hawk-owl in the Magdalen Islands in spring 1992, during this same invasion period.

I discovered a Northern Hawk-owl at 10:15 a.m. on 2 May along the major highway (Route 99) 3 km south of Pointe-aux-Loups. The owl perched either on top of telephone poles or the lowest telephone wires and scanned for prey over the extensive open dunes, which were dominated by beach grass. Between 10:15 a.m. and 10:40 a.m., the bird left various perch sites on five fairly short, low hunting flights over the dunes. On its sixth attempt, the owl hovered 5 m above ground for 5 seconds, the only time hover-flight was used, and the next pounce was successful. The bird took 10 seconds to decapitate the microtine rodent and eat the brain. The owl then flew back to the lowest telephone wire near a pole.

The hawk-owl took four or five minutes to eat the anterior half of the rodent, including the skin and fur, though twice it let some intestinal matter fall to the ground. At 10:45 a.m., the hawk-owl took five seconds to store the posterior half of the rodent on a spool of the telephone pole where the lowest wire was attached; it flattened out the prey on the spool and fastened it in well, though I could see a portion of the prey on the spool. The bird then resumed hunting for 20 minutes, without success.

At 11:05 a.m., I simulated attempts for two minutes to climb the telephone pole which contained the cached rodent. The hawk-owl, which had been hunting from the top of a neighbouring telephone pole, flew to the topmost telephone wire directly above me (the only time the topmost wires were used) and repeatedly looked at me for one minute. Then the owl left the wire, emitted a single high-pitched squeal, snatched the rodent from the spool and flew to the top of the neighbouring telephone pole from whence it came. There, the owl finished eating by 11:15 a.m.

Food-caching behaviour by this vagrant Northern Hawk-owl, that is bringing the prey to a perch, feeding on and eviscerating the prey, and caching the uneaten portion on the spool of a telephone pole, is similar to caching behaviour in trees on its breeding grounds.[7,11] On 2 May, the date that caching was observed in the Magdalen Islands, hawk-owls are normally on breeding territories in the north.[5] The owl was not seen again on 2 May, nor afterwards, despite extensive search by myself and several local bird watchers. Consequently, this vagrant hawk-owl would not have been expected to store food over the long term. The hawk-owl defended its cached food by vocalizing at a potential usurper and retrieving the rodent, which was originally procured using energetically expensive hover-flight. These behaviours suggested that the cached portion of the rodent was a valuable buffer against daily food shortages.[6,13]

I thank A.J. Erskine and C.S. Houston for helpful comments on the manuscript.

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THE PUMA IN THE CENTRAL MOUNTAINS AND GREAT PLAINS — A SYNOPSIS

JAY W. TISCHENDORF, American Ecological Research Institute - AERIE, Box 380, Fort Collins, Colorado, and F. ROBERT HENDERSON, Cooperative Extension Service, Call Hall, Kansas State University, Manhattan, Kansas, USA.

Puma populations are well documented and well studied in the mountainous regions of Utah, Colorado, Wyoming, and other western states.[1,3,12,15,16] The Puma is widely known as Cougar or Mountain Lion. Rugged forested regions are classic habitat for this large North American cat.[32]

In non-montane areas of these states, however, the status of this highly adaptable felid is questionable. Even more uncertain is the extent and nature of the species' occurrence in the provinces of Saskatchewan and Manitoba, and in the states of North and South Dakota, Nebraska, and Kansas. In these latter areas there is, for the most part, a long tradition of Puma reports. The following is a synopsis of current knowledge and recent events relating to the Puma in this region.

Saskatchewan Saskatchewan Department of Environment and Resource Management biologist Wayne Runge writes, "In recent times the occurrence of the Cougar in Saskatchewan was first verified in 1948. In this case, one animal was taken by trapper Joe Fournier in the Pasquia Hills. This specimen is now in the Museum of Natural History in Regina [now the Royal Saskatchewan Museum]" (W. Runge, pers. comm.).

Runge continues "Cougars very likely lived in Saskatchewan prior to 1948, and it is very likely that their existence extends uninterrupted all the way back to the population(s) documented for the pre-settlement period (pre-1800)."

"During the past 20 years Cougar sightings have been made sporadically throughout the southern half of the province. In most cases the animals were associated with drainage systems or blocks of upland woody cover, or in some instances the southern portions of the provincial boreal forest."

Runge estimates a provincial Puma population of 20-100 individuals (W. Runge, pers. comm.). The species is protected throughout the province. Comprehensive information on Saskatchewan Pumas can be found in the works of the late Tom White, architect and self-taught biologist, especially his landmark 1982 report *Saskatchewan Cougar — Elusive Cat.*[27]

Manitoba Sporadic, unverified

reports of Puma kills extend back to 1879, when one was apparently taken in the Pembina Hills near North Dakota. The other accounts stem almost exclusively from the Brandon and Birtle-Riding Mountain areas.[30]

On Christmas Day 1973, a Puma was killed on a farm outside Stead, a small town 35 mi. northeast of Winnipeg. This cat, a two-year-old male, was the first authenticated record for the province and it vindicated the unverified sightings of many people who, over the years, had reported seeing large, tawny, long-tailed cats. The Stead specimen's skin and skull are maintained at the Manitoba Museum of Man and Nature.[30]

One cannot discuss Manitoba Pumas without mentioning the work of Robert Nero, well known for his Great Grey Owl work, and mammalogist Robert Wrigley. Their 1982 book, *Manitoba's Big Cat*, a follow-up to a lengthy 1977 *Canadian Field- Naturalist* paper, is the definitive compendium on Pumas in the province.[20,30]

Though some mammalogists question the existence of the Manitoba Puma population — Nero and Wrigley estimated the presence of up to 50 animals — the species is fully protected and Puma reports continue to be made to Manitoba Museum and Department of Natural Resources (DNR) staff at a rate of 10-50 annually.[13]

Minnesota and Wisconsin In addition to the above mentioned reports, the presence of a small Manitoba population is further supported by at least four decades of intermittent but verified Puma reports in northern Minnesota and growing numbers of reports from northern Wisconsin.[4,14,17,23,31] Indeed, based on these records and numerous other unconfirmed but reliable reports, the DNR's of both of these states believe their states have, at times, small, resident populations of Pumas.

North Dakota There are very few Pumas in North Dakota, and almost certainly no resident, breeding population. The most recent Puma specimen was taken between 31 December 1990 and 4 January 1991. This cat, an 81-lb., one-year-old female, was shot by Coyote hunters in a barn in Golden Valley County in the North Dakota Badlands (Steve Allen, ND Fish and Game Dept., pers. comm.). This is the most recent confirmed specimen for the state.

Generally, Puma reports received by the North Dakota Fish and Game Department are infrequent and tend to come from west of the Missouri River and from the Turtle Mountains in the north central part of the state.

In terms of prey and habitat, the potential for increased Puma presence in North Dakota undoubtedly exists. Laws to protect the species were enacted 1 July 1992 (Lou Huffman, pers. comm.).

South Dakota The historical presence of Pumas in South Dakota, particularly in the Blacks Hills, is well substantiated.[32] In December 1957, a Puma was killed at Elk Mountain, and today a resident population is presumed to exist within the Black Hills-Custer National Forest-Custer State Park complex (Eileen Dowd and Ted Benzon, South Dakota Game, Fish and Parks Dept., pers. comm).[10,18]

In 1974, while conducting aerial hunting operations for Coyotes, biologist Lou Huffman observed an

Cougar. *Wayne Lynch*

adult Puma and its kitten along the White River near Winner (L. Huffman, pers. comm.). In December 1992, a young 90-lb. Puma was captured alive by a Coyote trapper in eastern South Dakota near Lowery (Ted Benzon, SD Game, Fish and Parks Dept., pers. comm.). It was radio-collared and released in the Black Hills. Tracking was discontinued after seven days largely due to concern over state liability if the cat were to become a depredator or nuisance animal.

Nebraska In November 1991, an 80-lb. female was shot and killed in the Nebraska panhandle.[19] A month later a young male was discovered near Worthington in the intensively agricultural region of southwest Minnesota.[2] It was subsequently caught and translocated to Colorado. It is quite possible that both these cats were dispersing from the isolated and presumable easily saturated Black Hills population. Another scenario has them originating in Wyoming or Colorado. In any case, the Nebraska cat, taken by a Dawes County deer hunter, was the state's first confirmed kill in a century.[11]

The species is unprotected in Nebraska, and though Puma reports have been made for decades, these animals are almost certainly transients.[21]

Kansas The pattern is much the same in Kansas, where Puma reports persist despite the last verified Puma kill occurring in Ellis County, central Kansas, in 1904.[7]

Pumas are frequently reported in eastern Kansas, a situation difficult to explain considering the nearest known populations are in Texas, New Mexico, Colorado, Wyoming, or South Dakota. Though their presence has yet to be verified, it is not unlikely that bordering Kansas there is a dispersed population of Pumas using a habitat complex encompassing the Ozark, Ouachita, and Mark Twain National Forests of Missouri and Arkansas.[22,24]

Under Kansas laws, the Puma is protected. One should refer to Gabbert and Henderson for a full discussion of the species' history and status there.[8] Data gathered during preparation of this report led to the establishment of an official Puma record-keeping system by the Cooperative Extension Service at Kansas State University. Between May 1990 and August 1993, 156 purported Puma observations were tallied.

Discussion As deer populations have recovered and increased following early and mid-1900 lows, it appears there have been parallel increases in Puma numbers. Additionally, concurrent decreases in the rural human populations have opened, or reopened, Puma habitat. The phenomenon of ephemeral, or cryptic, Pumas in areas where for many years they have been thought extirpated is not new.[28,29]

A steadfast believer in the continued existence of the Eastern Cougar, or Panther, the late Canadian ecologist and pioneer frogman-commando Bruce Wright was vindicated in August 1993 when a set of tracks and a scat found in a forested area of east central New Brunswick were confirmed as those of a Puma.[6] Though the origin of this cat will remain uncertain, the sparse settlement and remoteness of the area tend to preclude the possibility of its release or escape from captivity. Further investigation of Puma presence here and in New England is certainly merited.[25]

The range of the White-tailed Deer is expanding northward, and with it, that of the Puma. In the Kluane Lake region of the Yukon territory, for instance, Puma sightings are becoming more frequent, and on Alaska's Wrangell Island an adult male was shot in the fall of 1989 (Urs Breitenmoser, pers. comm., and Chris Land, Alaska Dept. of Fish and Game, pers. comm.).[5,26]

The same situation may be unfolding in the eastern half of suspected Puma range. In May 1992, 200 mi. south of James Bay, a Puma was shot near Lake Abitibi on the Quebec-Ontario border. Well into the boreal forest, this outpost area has for years been a hot bed of Puma reports and is closer to the historic range of the endangered Eastern Cougar, *Felis concolor couguar*, than that of any other race.[9] The specimen, a small male, is presently being evaluated at the Canadian Museum of Man and Nature. Hopefully, a determination of the cat's genetic and subspecific status will be made.

The question of Puma subspecies — and there are upwards of 30 — is for the most part academic. Most were classified by mere handfuls of skins, skulls, and parts thereof in a time when taxonomic splitting and name dropping were vogue.[32] Given the Puma's widespread historic range and its propensity for wandering, the supposed subspecific differences, often exceedingly minor, are probably only figments of small sample sizes and taxonomists' imagination. With the advent of DNA-based genetic evaluation, new light will soon be shed on this subject. This is especially important for management of endangered and pur- portedly unique subspecies like *couguar* (East), *coryi* (Florida), *schorgeri* (Wisconsin), *browni* ("Yuma puma" of Arizona-California), and *costaricensis* (Costa Rica).

The role of escaped or released captives is also an important factor in the issue of Pumas in areas not recently considered to be acceptable habitat. Unfortunately, there is almost no instance in which the possibility of a former captive Puma playing a role in a sighting, recolonization, or range expansion can be completely ruled out.

In Kansas, for example, 18 people are licensed to breed and sell Pumas. Additionally, many individuals in Kansas maintain Pumas as pets and until recently no license for this was required, making documentation of origins and fates of such pets extremely problematic. So, sadly, people do own and breed these animals, often with very little regulation and monitoring from their regional governments. It follows that some Pumas, one way or another, eventually become feral. Such feral individuals, if they become nuisance animals or depredators, give the entire species a bad name and can negatively impact bona fide conservation and restoration efforts.

Escaped or released captives that successfully adapt to the wild, however, deserve the same treatment afforded native, wild-born Pumas or other, officially translocated, wildlife, be they otters, trout, Red Wolves, or turkeys — just as we provide full protection to the hybridized and captive-born Peregrine Falcons that today sail so many of our skies.

In any case, as the New Brunswick incident discussed above shows, each verified Puma report must be evaluated and managed individually if true objectivity is to be maintained.

It is unfortunate that in so many cases the proof-positive of Puma presence — even despite the convincing evidence of independent but unverified and thus scientifically unacceptable sightings — comes down to a carcass in the hand. Ironically, it is often only after a Puma is killed in a jurisdiction that the species is granted official protection there.

History has repeatedly shown that where people are reporting Pumas, chances are good it is Pumas that at least some of them are seeing. Why wait to protect them?

Pumas leave distinctive signs — tracks, scrapes, or scratches, kill and scat. Unfortunately, few conservation professionals in the Great Plains, Midwest, and East have experience looking for, finding and interpreting this evidence. A comprehensive field guide to Puma sign, designed for layperson, woodsman and professional alike, is badly needed.

This paper is dedicated to the memory of Thomas Frederick Randall White, Regina, Saskatchewan, 1929-1984.

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NATURE LIBRARY

KNEE-HIGH NATURE\WINTER — A GUIDE TO NATURE ACTIVITIES AND FUN

DIANNE HAYLEY and PAT WISHART. 1993. Illustrated by Jo-El Berg. Lone Pine Publishing, Edmonton. 170 pp., coil bound, soft cover. $14.95.

Prairie winters can be long and cold, but they don't have to be boring. The natural world is still there, although hidden and sheltered from the elements. The authors state, "We want to increase awareness and appreciation of nature, to encourage adults to share their knowledge with children, and to help create opportunities for children to share their sense of wonder with adults." This is a good resource book to achieve that end.

This is one in a series of four seasonal resource books. *Spring in Alberta*, *Fall in Alberta* and *Summer in Alberta* are the other books in the series. The *Winter* text includes sections on hibernation, winter bird species, snow and ice, rodents, weasels, hares and rabbits, the deer family, wolves, coyotes and foxes, and a section on winter nights. Each section provides basic yet interesting information. Topics are brief so that children aren't overwhelmed with detail and information.

Although this book is written for Alberta, it is applicable in provinces and states that have prairie, parkland, mountain or boreal forest ecosystems. Species are included from all these ecosystems. For example, information is given on Steller's Jays and Mountain Goats from the mountains, and Sage Grouse and Pronghorn from the prairies. As well, information on other species like Downy Woodpeckers and White-tailed Deer that occur in all regions is given.

The author states, "This is a book for children to use with adults. Parents, teachers and group leaders can share the book with very young children, and older children can enjoy and learn from the book on their own." The text is easy to read and isn't too technical. The book could be read easily by most grade four to six students. The natural history descriptions of the various animals are appropriate for a wide age range of children. Activities, songs and poems could be used with primary students. Virtually every page has one or two line drawings to illustrate the topic.

This book has a variety of activities provided for each topic of study. Each section provides natural history information and drawings, as well as other activities such as craft projects, poems, songs, and games. For example, in the chapter on winter birds, the book describes the characteristics by which more than 30 common winter birds can be identified, interesting "Neat Notes," children's poems and songs, a story about a chickadee, an art activity project, and a bird feeding activity. All the other chapters follow a similar format incorporating several activities.

Knee High Nature\Winter is a book that can be used at home, at school, or in the field. On a winter field trip or on a winter bird count, this would be a good book to have to discuss the wildlife, tracks, and signs encountered in the bush. It is a good introduction to winter wildlife for children.

Reviewed by *John Pollack*, Box 353, Whitewood, Saskatchewan. S0G 5C0

WISDOM OF THE ELDERS

PETER KNUDTSON AND DAVID SUZUKI. 1992. Stoddart Publishing, Toronto. 232 pp. $27.95.

The December 1993 issue of *Blue Jay* (51:207) carried a short quote from the famous Chief Seattle (Seeathl, really) “speech,” which is reputed to have been delivered in 1854 in Washington State. After reading the note, I wrote Lynn Brown, *Blue Jay* editor, indicating that most of the famous “speech” has been shown to lack authenticity. The result of our exchange of correspondence is this book review and short essay on the Seeathl story.

Although I questioned the Seeathl “speech” when I first read it in the mid-1970s, it was not until I read Peter Knudtson and David Suzuki’s book, *Wisdom of the Elders* that my suspicions about the “speech’s” authenticity were confirmed. The authors explain that the Chief likely really did give “a speech of some sort between 1853 and 1855 somewhere in Washington Territory...” A Dr. Henry Smith apparently did make notes of the Chief’s talk, after it was translated from his Lushotseed tongue into Chinook and then English. These notes were re-written in 1931, and again in 1969. The often-quoted version, however, was written in 1970 by Ted Perry for a screenplay, and it this heavily dramatized version with clear inaccuracies that has become such a favourite of environmental and anthropological writers.

Perry apparently had no wish to have his screen script quoted as authentic, but he could not stop it because he had no copyright to it. Knudtson and Suzuki write that this unintentional hoax was exposed first by Robert Kaiser from Germany at “the European Association for American Studies in Rome in 1984,” but it received little publicity. So little, in fact, that the renowned anthropologist, David Maybury-Lewis, quotes from the phoney version in his otherwise impeccably researched and timely *Millennium: Tribal Wisdom and the Modern World*, 1992 (Viking, New York).

I should mention that the cause of my questioning the “speech’s” authenticity the first time I read it relates to where it tells of the Chief watching passengers shoot bison from rail cars while travelling by train across the Great Plains. This prior to 1854? In fact, the United States railway system had not yet extended west of the Mississippi River by 1854, and the first transcontinental railway line was not completed until 1869.

So why did this unintentional hoax happen? I believe there are two root causes. One, identified by Knudtson and Suzuki, springs from the current environmental consciousness, the human desire to improve the world and to find early wisdom in this regard from among people who lived close to the land. The second cause is named myth development by Stephen Jay Gould, and is applicable in this problem of the cloned screenplay speech. This case clearly is reminiscent of Gould’s “The Case of the Creeping Fox Terrier Clone,” in *Bully for Brontosaurus*, 1991 (W.W. Norton, New York). The “fox terrier clone” is the science-perpetuated myth that ancient horse ancestors were of fox terrier size. Once stated in an old, 19th century palaeontological publication, this mistake was repeated over and over again from textbook to textbook to where it is still learned by students this very day! This is lazy “scholarship,” sometimes resulting in blind perpetuation and acceptance of fatuous falsehoods.

Having explained a major reason for this book review, now the review. Knudtson and Suzuki's main goals clearly are to draw attention to the need to apply the traditional environmental knowledge of hunting and gathering peoples, those closest to the land, to environmental management and to ecological science. There can be no question that this very well written and thoroughly researched cross-disciplinary book makes a strong case for such application to environmental management. The book establishes the truth about the great depth of environmental knowledge held by many indigenous hunters-gatherers. It is less successful in establishing the groundwork for using such knowledge to advance ecological science.

These strengths and weaknesses aside, *Wisdom of the Elders* is a fascinating collection and ecological interpretation of hunting and gathering adaptive strategies from around the world. Yes, the authors took advantage of a trend currently sweeping the realm of environmental management, which is to use indigenous traditional knowledge to augment the scientific principles of environmentally sound landscape management. In Canada, this trend is bearing fruit in "co-management" boards springing up in many places. Perhaps an unwritten goal of the book is to explore the cutting edge of a field of endeavour and to be seen to be doing this, and, if it is, Knudtson and Suzuki certainly succeed, although the central idea predates the book.

Small weaknesses aside, this is really an excellent book from most respects: writing, research, thoroughness, comprehensiveness, lucidity, organization, design, and printing. With regard to the major hope expressed in the book, that traditional knowledge be used to develop ecologically sound environment management strategies, the news is good — it is happening already. My only warning to readers is that, with regard to the expressed desire that traditional knowledge also should be highly useful in advancing ecological science, the jury is still out.

Reviewed by *Henry Epp*, 147 Green Meadow Road, Regina, Saskatchewan.
S4V OA7

* * *

According to a 1991 Environment Canada survey on "The importance of wildlife to Canadians":
4.1 million Canadians photographed wildlife;
2.4 million travelled to view waterfowl;
6.6 million purchased special feed for wildlife;
7.1 million maintained bird houses, plants and shrubs for wildlife; and
18.9 million (90.2% of the population) took part in one or more wildlife related activity, spending $5.6 billion.

LETTERS

FLYING SQUIRRELS IN THE DEAD OF WINTER

Enjoying the winter presence of birds, we keep feeders stocked with seeds and blocks of suet. During the day it is not unusual to see a mixed flock with any number of Common Redpolls, Pine Grosbeaks, Blue Jays, White-breasted Nuthatches, Black-capped Chickadees, and occasionally a Downy, or even a Hairy, Woodpecker. On warm spells, a Red Squirrel might appear to stock up on sunflower seeds.

On 3 January 1993, we were surprised by a pair of Flying Squirrels. We were very surprised, because it was 10:18 p.m., still and cold (-18°C). We spotted the squirrels leaping from the poplar trees to the feeder, which hangs from an outside branch, nearest our driveway, about 8 m from the house. The squirrels were loading up on sunflower seeds, and were not inclined to leave, even when we went outside to try to get a better look at them. They were shy, trying to keep the trunk of the tree between themselves and us, until we both got a flashlight beam on them from two different angles. As indicated by their huge eyes, their nocturnal behaviour was normal, but their activity in the bitter cold was surprising. These were the first Flying Squirrels we had spotted down in our area, and we would not have seen them at all if the feeder had not been illuminated by our yard light.

There were indications of squirrel activity in the yard, including snow tunnels and tracks in the snow, although it is difficult to know whether these were from the more common Red Squirrel or the Flying Squirrels. We tried to find the winter nests of the squirrels, but, while ground tracking is easy, the branches used as aerial highways are not discernible, and we have been disappointed. To date, we have had no more sightings of the Flying Squirrels, during any part of the day.

Terry and Randy Langelier, Box 306,
Blumenort, Manitoba. R0A 0C0

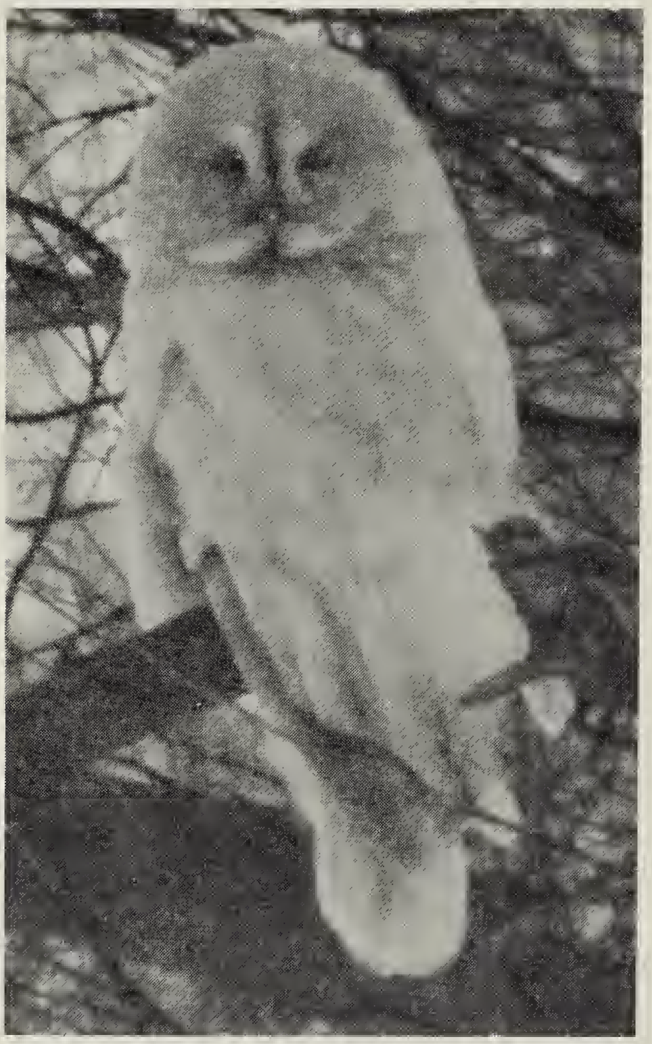
Editor's Note: Generally squirrels are active when winter temperatures are above -20°C, with activity tapering off as temperatures drop. There is usually little activity when temperatures drop below -30°C.

The observation of live birds in their natural habitat is a popular pastime and scientific sport that developed almost entirely in this century, according to the *Encyclopedia Britannica*. In the 19th century, almost all students of birds carried guns to knock down unfamiliar specimens for examination. As binoculars improved, life got a lot easier for birds. *Globe and Mail. 8 March 1994*

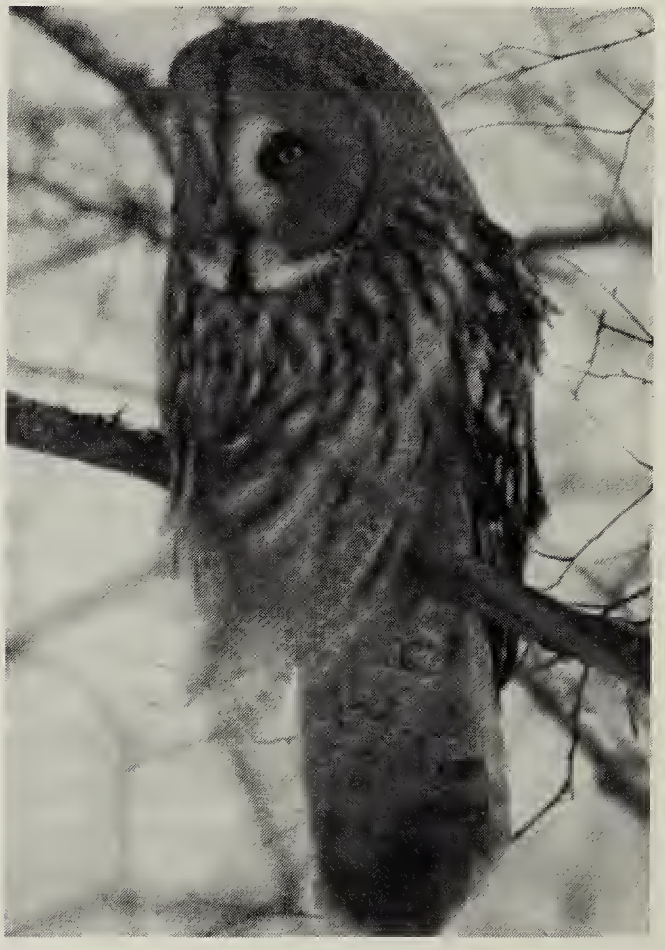
ALBINO GREAT GRAY OWL IN FINLAND

In April 1994, I photographed an albino Great Gray Owl in central Finland. From a colleague in Toronto, I learned that *Blue Jay* had an article about albino Great Gray Owls with a picture on the front page [*Blue Jay* 49:31]. For your use, I enclose two photographs of Great Gray Owls taken near Kuopio, Finland, 1 April 1994.

Ignaz Wanders, Flogstavagen 25B:233,
752 63 Uppsala, Sweden.



Albino Great Gray Owl. I. Wanders



Normal Great Gray Owl photographed in same spot as albino, one hour later. I. Wanders

Watching watchers: Occasionally, bird watchers themselves have been watched. In 1960, for instance, English psychologist Helen Ross tracked a covey of zoologists in the Norwegian Arctic, recording their foul language. They were most vocal when relaxed and happy, she writes in *Discovery* magazine. “The words used were blasphemous rather than obscene, as is to be expected among the middle class.” *Globe and Mail. 8 March 1994*

IN MEMORIAM

GORDON SILVERSIDES, 1927-1994

PAT ADAMS, 401-108 Street, Saskatoon, Saskatchewan. S7N 1R1

On July 3rd the Saskatoon Natural History Society lost a member who will be remembered for, among other things, his persistent efforts over several years to preserve the Saskatoon Natural Grasslands (Silverspring Prairie). Even after the land passed into the ownership of the Meewasin Valley Authority (paid for with Gordon's $1.00!), he continued to spearhead efforts to set up the Nature Centre, assemble its exhibits and arrange for volunteers to interpret the prairie. Even though he was

Gordon Silversides with students at the Nature Centre. *Melanie Elliott* assisted by others, he was the driving force behind the Nature Centre. He used to say, “We must preserve this prairie to show what our farmland came from and to let people see the diversity of life which existed in the prairie ecosystems.” To ask Gordon about the prairie was to initiate a lesson in learning.

Gordon, whose parents were teachers, was born in Wolseley, Saskatchewan, and received his Bachelor of Education from the University of Saskatchewan. He taught in northern Saskatchewan, Jamaica and Moose Jaw, before retiring in Saskatoon 12 years ago with his wife, Alice.

Gordon enjoyed participating in the activities of the Golden Eagles, a group of seniors in the Saskatoon Natural History Society. He was seldom seen there without his Tilley hat covered with pins or his knitted toque.

Gordon was a perceptive member of the Board of our Society. He had the vision to see things that could be achieved and accepted responsibility for making changes. For example, he was not only a supporter of the concept of establishing a resource centre for the Society but also volunteered to set it up and to staff it each Monday for its first year.

Gordon was always enthusiastic about the outdoors and the environment and carried this over into this career. In 1992, in recognition of these efforts, he received the B. M. Melanson Award from the Saskatchewan Outdoor and Environment Education Association and the Conservation Award from Nature Saskatchewan. In December 1993, Gordon received the ninth annual “Conservation Award” from the Meewasin Valley Authority (MVA) for outstanding contributions to conservation within MVA’s jurisdiction.

* * *

No wonder that birds of such a feather have been hunted since the days of the Aztecs, when cloaks made entirely of hummingbird skins were worn by nobles of Montezuma’s court... With the Victorian age of exploitation and over-adornment, the slaughter of hummers increased. The glittering skins were made into millions of artificial flowers and useless dust catchers. Thus in 1888, in Brazil, three thousand skins of the marvelous topaz-throat were mashed together in a single bale which was disposed of in London at auction, along with twelve thousand other exquisite little hummer carcasses. *Donald Culross Peattie. 1947. A cup of sky. Houghton Mifflin, Boston. (Krutch & Eriksson. 1962. A treasury of birdlore. Eriksson, NY. P. 17)*

* * *

Birders: An overlapping term with “bird watchers,” who observe the birds’ behaviour. “Birders” have special interest in adding to their lists of species sighted. In Britain, they are known as “twitchers” — a term they dislike — and there are currently three paging services that rent beepers to alert them when a rare bird visits the British Isles. *Globe and Mail. 8 March 1994*

SOCIETY NEWS

NATURE SASKATCHEWAN 1994 ANNUAL GENERAL MEETING

The 1994 annual general meeting was held in Moose Jaw in early October.

Following is a list of 1994 award recipients:

Frank Switzer of Regina went home with the Larry Morgotch Award, for his series of impressive slide shows on a variety of subjects.

Lynn Oliphant of Saskatoon was presented the prestigious Conservation Award for his lifetime commitment to nature study and conservation.

A new award for the Volunteer of the Year was given to **Muriel Carlson** of Saskatoon for her efforts in raising money for and awareness about the Turtle Lake Nature Sanctuary.

Ed Walker, Catherine Letkeman, and **Ron and Val Andrews** of Moose Jaw and **Lise Perrault** of Val Marie were named as Nature Saskatchewan Fellows.

Keith Barr of Regina won the Cliff Shaw Award for a series of short articles in *Blue Jay.*

LEDINGHAM RECEIVES SASKATCHEWAN ORDER OF MERIT

George Ledingham of Regina received the Saskatchewan Order of Merit, 27 October 1994. The Order of Merit recognizes individual excellence and outstanding contributions to the social, cultural and economic well-being of the province and its residents.

Ledingham, retired professor of botany, born in Moose Jaw in 1911, took his first degrees at the University of Saskatchewan and a doctorate in plant genetics at the University of Wisconsin in 1939. After working on the family farm during the war years, he taught biology at Regina College, then the University of Regina for forty years. He inspired generations of students with his enthusiasm for conserving nature and the environment. After retirement from full-time teaching in 1978, Dr. Ledingham was named professor emeritus and curator of the herbarium, a collection of dried specimens of plants. He continued part-time instruction until 1983 and still works every day at the herbarium.

George Ledingham has an international reputation as a conservationist and expert in prairie plants and ecology. He was a founding member of Nature Saskatchewan [then the Saskatchewan Natural History Society] and served for 16 years as the editor of *Blue Jay*. He has collected over 50,000 specimens of vascular plants in the herbarium and is now collecting moss and lichen specimens. A species of plant he discovered in Iran in 1966 has been named after him. Dr. Ledingham was instrumental in the establishment of the Grasslands National Park in southern Saskatchewan. He is a self-trained authority on Saskatchewan birds. In 1986, the University of Regina conferred an honourary doctorate of laws on him and in 1990 named the George F. Ledingham Herbarium in his honour. He has received the Canada 125 medal in addition to awards from Parks Canada, Environment Canada and the Canadian Nature Federation.

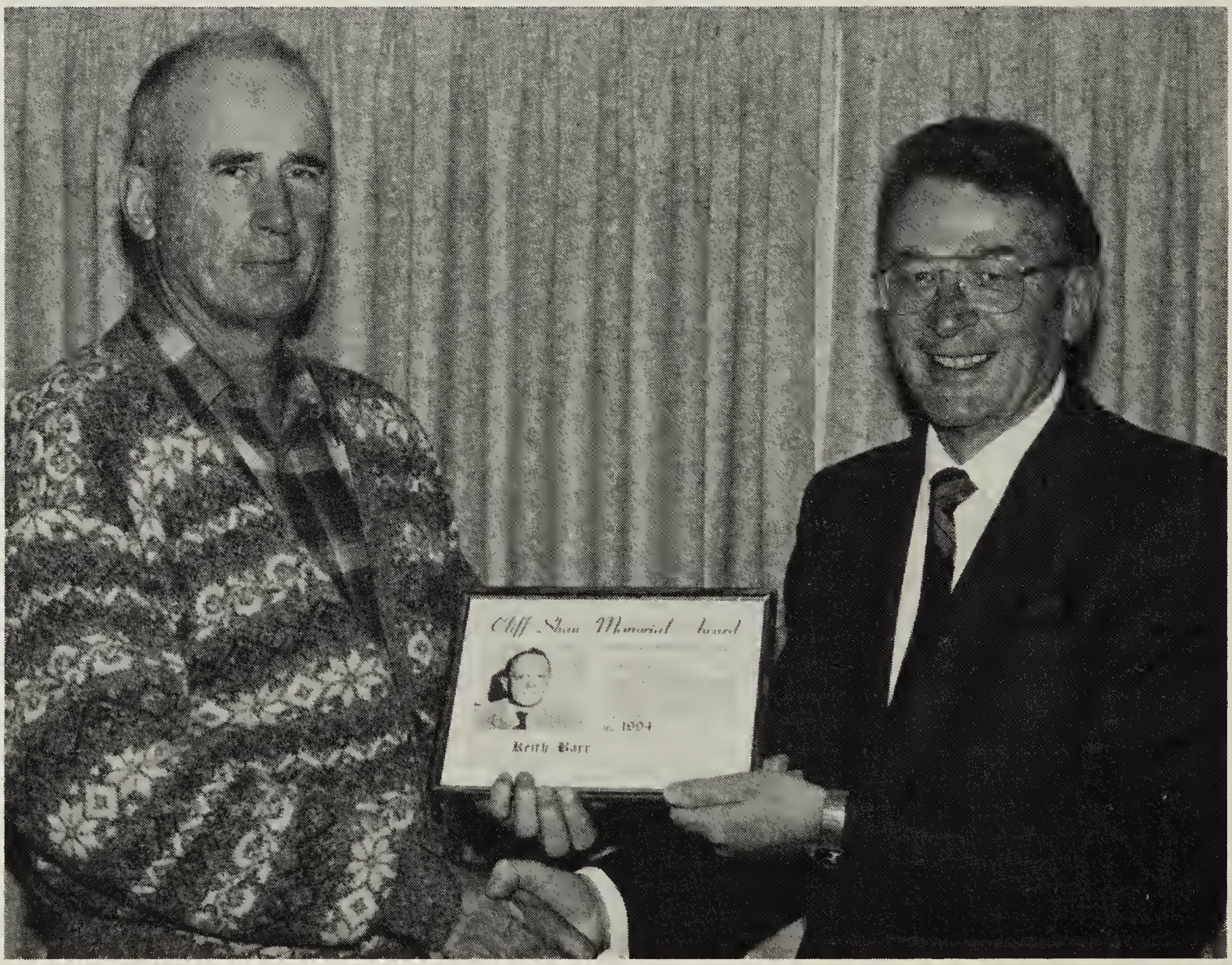
SASKATCHEWAN NATURAL HISTORY SOCIETY BALANCE SHEET AS AT 31 AUGUST 1994 (revised)

Assets	**Operating Fund ($)**	**Trust Fund ($)**	**Managed Fund ($)**	**Total 1994 ($)**	**Total 1993 ($)**
Cash and short-term deposits	128,347	50,078	—	178,425	199,650
Accounts receivable	34,532	—	—	34,532	18,154
Inventory	13,080	—	—	13,080	12,658
Prepaid expenses	3,222	—	—	3,222	1,024
Marketable securities (quoted market value $249,451; 1993 - $245,438)	—	249,310	—	249,310	242,735
Capital (note 4)	50,536	—	—	50,536	40,245
Interfund receivable (payable)	(42,233)	—	42,233	—	—
	187,484	**299,388**	**42,233**	**529,105**	**514,466**
Liabilities and Members Equity					
Accounts payable and Accrued liabilities	5,049	—	—	5,049	5,599
Deferred amounts Funding (note 5)	69,581	—	—	69,581	69,323
Restricted					
Open (schedule 1a)	28,609	—	—	28,609	44,007
Closed (schedule 1b)	7,874	—	—	7,874	8,130
Managed (schedule 5)	—	—	42,233	42,233	21,931
	111,113	—	**42,233**	**153,346**	**148,990**
Fund balances (schedule 4 - trust fund)	25,835	299,388	—	325,223	325,231
Equity in capital assets	50,536	—	—	50,536	40,245
	187,484	**299,388**	**42,233**	**529,105**	**514,466**

SASKATCHEWAN NATURAL HISTORY SOCIETY STATEMENT OF FINANCIAL ACTIVITIES AND FUND BALANCE FOR THE YEAR ENDING 31 AUGUST 1994 (revised)

Income	Operating Fund ($)	Trust Fund ($)	Managed Fund ($)	Total 1994 ($)	Total 1993 ($)
Grants					
Sask Lotteries	106,400	—	—	106,400	101,100
Conservation Prog.	27,483	—	—	27,483	16,325
Education	3,377	—	—	3,377	—
Endangered spec.	18,052	—	—	18,052	9,000
Spec. prog. (sched. 1)	19,980	—	—	19,980	30,512
Self gen. (sched. 2)	50,067	—	—	50,067	42,310
Other rev. (sched. 3)	42,771	—	—	42,771	—
Trust fund - net (sched. 4)	—	3,696		3,696	9,405
Managed fund (sched. 5)	—	—	90,379	90,379	—
	268,130	**3,696**	**90,379**	**362,205**	**208,652**
Expenses					
Admin. (sched. 6)	104,168	—	—	104,168	90,762
Travel/Mtg. (sched. 7)	11,848	—	—	11,848	8,340
Communication (sched. 8)	33,927	—	—	33,927	32,113
Programs (sched. 9)	81,101	—	—	81,101	91,904
Other expenses (sched. 10)	40,790	—	—	40,790	—
Managed funds	—	—	90,379	90,379	—
	271,834	**—**	**90,379**	**362,213**	**223,119**
Net income (loss)	(3,704)	3,696	—	(8)	(14,467)
Fund balance, beginning of year	29,539	295,692	—	325,231	339,698
Fund balance, end of year	**25,835**	**299,388**	—	**325,223**	**325,231**

Muriel Carlson receives the Volunteer of the Year Award from Paul Chytyk.



Keith Barr is presented the Cliff Shaw Memorial Award from President Douglas Schmeiser.

INDEX TO VOLUME 52, 1994

Compiled by GAIL BUNT, 872 Saskatchewan Crescent East, Saskatoon, Saskatchewan. S7N 0L4

A

Abies balsamea - Balsam Fir 197
Ablabesmyia annulata 201
Ablabesmyia aspera 201
Ablabesmyia illinoensis 202
Achillea millefolium 194
Acorus calamus - Sweet Flag 194
Acricotopus lucens 201
Acricotopus nitidellus 203
Acricotopus senex 203
Actaea rubra - White Baneberry 198
Adams, Pat
    Gordon Silversides, 1927-1994 229
Agricultural policy 185
Agropyron trachycaulum - Slender Wheatgrass 198
Agrostis scabra - Rough Hair-grass 198
Agrotis daedalus - Daedalus Dart 91
Agrotis ipsilon - Dark Sword Grass 92, photo 92
Agrotis kingi - King's Dart 91
Agrotis mollis - Mollis Dart 91
Agrotis musa - Musa Dart 91
Agrotis obligua - Oblique Dart 92
Agrotis orthogonia - Pale Western Cutworm 91
Agrotis robustior - Robust Dart 91
Agrotis stigmosa - Pointed Dart 92
Agrotis vancouverensis - Vancouver Dart 91
Agrotis venerabilis - Venerable Dart 91
Agrotis vetusta - Old Man Dart 91
Agrotis volubilis - Voluble Dart 92
Alberta
    Bear Canyon, lepidoptera 87
    Bear Mountain, lepidoptera 87
    Beaverhill Lake, birds 206
    Beaverlodge, lepidoptera 87
    Bluesky, lepidoptera 87
    Brownvale, lepidoptera 87
    Calais, lepidoptera 87
    Calgary, birds 206
    Camp Island, lepidoptera 87
    Canmore, birds, photo 169
    Cecil Lake, lepidoptera 87
    Clairmont Lake, lepidoptera 87
    Clayhurst, lepidoptera 87
    Clayhurst Bridge, lepidoptera 87
    Clear River, lepidoptera 87
    Codessa, lepidoptera 87
    Dawson Creek, lepidoptera 77
    Deadwood, lepidoptera 87
    Deadword fire tower, lepidoptera 87
    Debolt, lepidoptera 87
    Demmit, lepidoptera 87
    Didsbury, birds 209
    Dixonville, insect, photo 72
    Dunvegan, lepidoptera 74
    Dunvegan Hill, lepidoptera 74
    Edmonton, birds 206, plants 115
    Elmworth, lepidoptera 87
    Fairview, lepidoptera 87
    Fairview Ski Hill, lepidoptera 87
    Figure 8 Lake, lepidoptera 87
    Fort Vermillion, lepidoptera 87
    Fort White Earth, birds 208
    Gage, lepidoptera 87
    George Lake, lepidoptera 87
    Grande Prairie, lepidoptera 87
    Green Island, lepidoptera 87
    Grimshaw, lepidoptera 87
    High Prairie, lepidoptera 87
    Highland Park, lepidoptera 87
    Hines Creek, lepidoptera 87
    Kleskun Hill, lepidoptera 87
    Lac Cardinal, lepidoptera 87
    Leptidoptera 87, 96
    Manning, lepidoptera 87
    Mount Rae, mammals ii no. 1
    Northstar, lepidoptera 87
    Peace River region, lepidoptera 87
    Peace River (town), lepidoptera 87
    Sandhill Lake, lepidoptera 87
    Shaftesbury Ferry, lepidoptera 87
    Smokey River, lepidoptera 87
    Spirit Ridge, lepidoptera 87
    Sunset Prairie, lepidoptera 87
    Thunder Lake, birds 208
    Wainwright, birds 207
    Wembley, lepidoptera 87
    White Mountain, lepidoptera 87
    Whitelaw, lepidoptera 87
    Woking, lepidoptera 87
    Wood Mountain National Park, birds 113, 116
    Worsley, lepidoptera 87
Albinism 165
Alnus crispa - Green Alder 195
Alnus rugosa - Speckled Alder 195
Alopecurus aequalis - Short-awned Foxtail 198
Amblyscirtes vialis - Roadside Skipper 74
Amelanchier alnifolia - Saskatoon Serviceberry 199
Andrews, Ron, Nature Saskatchewan Fellow 231
Andrews, Val, Nature Saskatchewan Fellow 231
Andromeda polifolia - Bog Rosemary 196

Antennaria dimorpha - Cushion Everlasting 128
Antennaria parvifolia - Small Pussytoes 194
Apocynum androsaemifolium - Spreading Dogbane 194
Apsectrotanypus johnsoni 201
Arabis divaricarpa - Purple Rock Cress 195
Arabis hirsuta - Hirsute Rock Cress 195
Aralia hispida - Bristly Sarsaparilla 194
Aralia nudicaulis - Wild Sarsaparilla 194
Arceuthobium americanum - Pine Mistletoe 197
Archaeology 66
Arctostaphylos uva-ursi - Common Bearberry 196
Aster ciliolatus - Lindley's Blue Aster 194
Astragalus canadensis - Canada Milk Vetch 196
Avens, Three-flowered, photo cover no. 4
Avicultural collections, private 139
Avocet, American 37
Award, Cliff Shaw Memorial 231, photo 234
Award, Conservation 231
Award, Larry Morgotch 231
Award, Nature Saskatchewan Fellows 231
Award, Saskatchewan Order or Merit 231
Award, Volunteer of the Year 231, photo 234
Axarius scopula 203

B

Badger, American 46
Bancroft, Jean
  A Bar-headed Goose Seen in Regina — a Possible First for North America 137
  Unusual Nest Site of Brown Thrasher 160
Barr, Keith
  Cliff Shaw Award 231, photo 234
  Gray Squirrel up a tree, photo 174
  Gray Squirrels and Magpies 174
  The House that Jack Built 167
  "Jack's" birdhouse, photo 167
  Nine Whooping Cranes 97
  Ruffed Grouse before display, photo 43
  Ruffed Grouse begins display, photo 43
  Ruffed Grouse Dance 43
  Whooping Cranes, photo cover no. 2
  Whooping Cranes near Regina, photo 98
Beaver, American 46
Beckidia tethys 202
Belanger, R.A.
  Weyburn Shorebird Study: 1990-1992 36
Belcher, Margaret
  Waldemir Yanchinski 55
Betula neoalaskana - Paper Birch 195
Betula pumila - Glandular Shrub Birch 195
Bidens cernua - Smooth Beggarticks 195
Bird song recording equipment 157
Birds, counts and surveys 4, 36, 152, 169
Birds that I thought I have known 214
Bittner, Ronald A.
  Bluebird Rescue, letter 118
Blackbird 23, 28
Blackbird, Brewer's 22, 172
Blackbird, Red-breasted 205
Blackbird, Red-winged 22, 156, 172
Blackbird, Rusty 14
Blackbird, Yellow-headed 158, 172
Bluebird, 118
Bluebird, Mountain 158
Bluebird Rescue 118
Bobcat 179; photos 179, 180
Boloria bellona jenistae - Meadow Fritillary 79
Boloria eunomia dawsoni - Bog Fritillary 79
Boloria freija - Freija Fritillary 80
Boloria frigga saga - Frigga's Fritillary 79
Boloria selene - Silver-bordered Fritillary 2, 79
Boloria titania grandis - Purple Fritillary 80
Book reviews
  Aerial Radio-Tracking of Whooping Cranes Migrating between Wood Buffalo National Park and Aransas National Wildlife Refuge, 1981-1984. KYUT 116
  American Butterflies. NORTH AMERICAN BUTTERFLY ASSOCIATION 135
  Butterflies East of the Great Plains. An Illustrated Natural History. OPLER and KRIZEK 135
  Butterflies of Alberta. ACORN 130
  Butterflies of North Dakota — an Atlas and Guide. ROYER 133
  Butterflies through Binoculars. A Field Guide to Butterflies in the Boston-New York-Washington Region. GLASSBERG 133
  The Common Names of North American Butterflies. MILLER 130
  Exploring the Grasslands: Understanding an Ecosystem. WILLSON 181
  A Field Guide to Eastern Butterflies. OPLER and MALIKUL 132
  Knee-high Nature\Winter - a Guide to Nature Activities and Fun. HAYLEY and WISHART 224
  Migration of Radio-Marked Whooping Cranes from the Aransas-Wood Buffalo Population. HOWE 116
  Peterson First Guide to Caterpillars of North America. WRIGHT 135
  Wisdom of the Elders. KNUDTSON and SUZUKI 225
Boreochlus persimilis 201
Brillia flavifrons 201
British Columbia
  Attachie, lepidoptera 87
  Bear Flat, lepidoptera 87
  Bear Mountain, lepidoptera 87

Beatton River, lepidoptera 87
Beatton River valley, photo 73
Boundary Lake, lepidoptera 87
Bullhead Mountain, lepidoptera 87
Clayhurst Bridge, lepidoptera 87
Dunlevy, lepidoptera 87
Fairview, lepidoptera 87
Fort St. John, lepidoptera 77
Goodlow, lepidoptera 73, 87
Halfway Indian Reserve, lepidoptera 87
Hudson Hope, lepidoptera 87
Lepidoptera 96
Peace River region, lepidoptera 87
Pouce Coupe, lepidoptera 87
Rose Prairie, lepidoptera 87
Sunset Prairie, lepidoptera 87
Taylor, lepidoptera 87
Bufflehead 22, 149
Bunch Berry, photo 193
Bunting, Snow 4
Butterflies, see Lepidoptera
Butterflies of the Peace River Region of Alberta and British Columbia 71

C

Calamagrostis canadensis - Blue Joint 198
Calla palustris - Marsh Calla 194
Callophrys augustinus - Brown Elfin 77
Callophrys eryphon - Western Pine Elfin 78
Callophrys niphon clarki - Eastern Pine Elfin 78
Callophrys polios obscurus - Hoary Elfin 78
Caltha natans - Floating Marsh Marigold 198
Caltha palustris - Marsh-marigold 198
Campanula aparinoides - Marsh Bellflower 195
Campanula rotundifolia - Common Harebell 195
Caragana arborescens - Caragana 196
Carex adusta - Browned Sedge 195
Carex aenea - Hay Sedge 195
Carex aquatilis - Water Sedge 195
Carex atherodes - Awned Sedge 195
Carex aurea - Golden Sedge 195
Carex crawfordii - Crawford's Sedge 195
Carex disperma - Soft-leaved Sedge 196
Carex houghtonii - Houghton's Sedge 196
Carex lanuginosa - Woolly Sedge 196
Carex rostrata - Beaked Sedge 196
Carex stipata - Awl-fruited Sedge 196
Carlson, Muriel, Volunteer of the Year Award 231, photo 234
Carterocephalus palaemon mandan - Arctic Skipper 73
Cat, Domestic 176
Cat, Feral 46
Catbird, Gray 158
Caught in the Act 182
Celastrina aragiolus lucius - Spring Azure 2, 78
Censuses, check lists, counts, and surveys
birds 4, 36, 169
lepidoptera
butterflies 1, 71
noctuinae - Dart Moths 91
mammals 45
Ceononympha inornata - Inornate Ringlet 31, 82
Cercyonis oetus - Dark Wood Nymph 82
Cercyonis pegala ino - Common Wood Nymph 1, 82
Chamaedaphne calyculata - Leatherleaf 196
Check List of Saskatchewan Moths Part 12: Dart Moths 91
Chenopodium capitatum - Strawberry Blite 195
Chickadee 163
Chickadee, Black-capped 4, 158, 172, 205
Chickadee, Boreal 14
Chimaphila umbellata - Prince's-pine 198
Chironomus hyperboreus 202
Chironomus pallidivittatus 202
Chironomus utahensis 202
Chlosyne gorgone - Gorgone Checkerspot 2, 80
Chlosyne palla - Northern Checkerspot 80
Christmas bird count - 1993 4
Christmas mammal count 1993 45
Chrysanthemum leucanthemum - Oxeye Daisy 195
Chukar 22
Chytyk, Paul, photo 234
Cicuta mackenzieana Raup. - Water Hemlock 194
Cicuta maculata - Western Water Hemlock 194
Circaea alpina - Small Enchanter's-nightshade 197
Cladopelma viridula 203
Clinotanypus 201
Close Encounter with a Bobcat 179
Coenonympha - Ringlet 2
Coenomympha inornata - Inornate Ringlet 71
Colias canadensis - Canadian Sulphur 76
Colias christina - Christina Sulphur 76
Colias communis - Common Sulphur 2
Colias gigantea - Giant Sulphur 76
Colias interior - Pink-edged Sulphur 76
Colias occidentalis - Alfalfa Butterfly 1
Colias palaeno chippewa - Palaeno Sulphur 76
Colias philodice - Clouded Sulphur 76
Comandra umbellata - Common Comandra 199
Conchapelopia fasciata 201
Conchapelopia pallens 201
Copablepharon grande - Grand Copablepharon 92, photo 94
Copablepharon longipenne - Brown Copablepharon 92
Copablepharon viridisparsum - Gray Copablepharon 92
Cornis canadensis - Bunch Berry 195, photo 193

Corydalis aurea - Golden Corydalis 196
Corydalis sempervirens - Pink Corydalis 196
Corynoneura scutellata 201
Cottontail 46
Cottontail, Eastern 46
Cottontail, Nuttall's 46
Cougar (see Puma)
Cougar, Eastern 221
Cowbird, Brown-headed 158, 160, 205
Coyote 45
Cnemidocoptes mutant 204
Cnemidocoptes piloe 204
Crane, Whooping 61, 97, 116
Creeper, Brown 4
Crepis tectorum - Narrow-leaved Hawksbeard 195
Cricotopus bicinctus 203
Cricotopus brunnicans 201
Cricotopus curtus 203
Cricotopus cylindraceus 201
Cricotopus flavocinctus 201
Cricotopus intersectus 203
Cricotopus ornatus 203
Cricotopus pilitarsus 201
Cricotopus sylvestris 203
Cricotopus tremulus 201
Crocus 115
Crossbill, Red 4
Crossbill, White-winged 4
Crow, American 4, 158, 172
Cryptochironomus blarina 202
Cryptochironomus psittacinus 203
Cryptochironomus stylifera 203
Cryptogramma crispa - Parsley Fern 194
Cryptotendipes casuarius 203
Curlew, Long-billed 38
Cypripedium acaule - Stemless Lady's-slipper 197
Cypripedium calceolus - Small Yellow Lady's-slipper 197

D

Danaus plexippus - Monarch 2
Deer, poem 54
Deer, Mule 46
Deer, Pronghorn 45
Deer, White-tailed 46
Derotanypus alaskensis 203
Destination: Aransas National Wildlife Refuge, Texas, January 1993 61
Diamesa cinerella 203
Dicrotendipes lucifer 202
Dicrotendipes tritomus 202
Dobie, Donald
  Weasels Come in Three Basic Sizes? ii no. 1
Dommasch, Hans
  American Robin at nest, photo 157
Dove, Mourning 4, 157, 172
Dove, Rock 4, 162, 170
Dowitcher 184
Dowitcher Flock Rescues Companion from Merlin 184
Dowitcher, Long-billed 39
Dowitcher, Short-billed 39
Downingia laeta - Downingia 128
Drosera anglica - Oblong-leaved Sundew 196
Drosera rotundifolia - Round-leaved Sundew 196, photo 194
Dryopteris carthusiana - Narrow Spinulose Shield Fern 194
Dryopteris fragrans - Fragrant Shield Fern 194
Duck 23
Duck, American Black 22
Duck, Black x Mallard 22
Duck, Harlequin, 149
Duck, Ruddy 22
Dunlin 39
Dyssodia papposa - Fetid Marigold 127

E

Eagle 23
Eagle, Bald 4, 117, 191
Eagle, Golden 14, 117
Ecosystems, study and teaching 181
Eleocharis palustris - Creeping Spike-rush 196
Elk, American 46
Elliott, Melanie
  Gordon Silversides, photo 229
Elymus innovatus - Hairy Wild-rye 198
Endochironomus subtendens 202
Epargyreus clarus - Silver-spotted Skipper 1
Epilobium angustifolium - Fireweed 197
Epilobium ciliatum - Northern Willow-herb 197
Epilobium palustre - Marsh Willow-herb 197
Equisetum arvense - Common Horsetail 196
Equisetum fluviatile - Swamp Horsetail 196
Equisetum scirpoides - Dwarf Scouring-rush 196
Equisetum sylvaticum - Woodland Horsetail 196
Equisetum variegatum - Variegated Horsetail 196
Erebia disa mancina - Disa Alpine 82
Erebia discoidalis macdunnoughi - Red Disked Alpine 82
Erebia epipsodea freemani - Common Alpine 82
Erigeron philadelphicus - Philadelphia Fleabane 195
Erigeron radicatus - Dwarf Fleabane 128
Eriophorum angustifolium - Tall Cotton-grass 196
Eriophorum brachyantherum - Close-sheathed Cotton-grass 196
Eriophorum chamissonis - Chamisso's Cotton-grass 196
Eriophorum gracile - Slender Cotton-grass 196
Eriophorum vaginatum - Sheathed Cotton-grass 196
Ermine 46

Erynnis icelus - Dreamy Dusky Wing 2, 72
Erynnis persius - Persius Dusky wing 73
Escaped birds versus wild vagrants, sources for distinguishing 139
Euchloe ausonides - Large Marble 76
Euchloe creusa - Creusa Marble 76
Euphorbia serpens - Serpent Spurge 126
Euxoa aberrans - Wandering Dart 96
Euxoa aequalis - Acornis Dart 93
Euxoa albipennis - White-winged Dart 94
Euxoa auripennis - Auripennis Dart 95
Euxoa aurulenta - Golden Dart 92
Euxoa auxiliaris - Army Cutworm 93, photo 95
Euxoa basalis - Pale-based Dart 93
Euxoa brevipennis - White-underwing Dart 94
Euxoa campestris - Flat Dart 93
Euxoa castenea - Chestnut Brown Dart 94
Euxoa catenula - Chain-dotted Dart 94
Euxoa chorus - Chorus Dart 94
Euxoa cicatricosa - Scared Dart 95
Euxoa cinereopallida - Utah Dart 93
Euxoa citricolor - Lemon-coloured Dart 96
Euxoa clausa - Closed Dart 94
Euxoa comosa - Hairy Dart 93
Euxoa cona - Cona Dart 96
Euxoa dargo - Dargo Dart 95
Euxoa declarata - Clear Dart 93
Euxoa detersa - Rubbed Dart 95
Euxoa difformis - Difformis Dart 95
Euxoa divergens - Divergent Dart 92
Euxoa dodi - Dod's Dart 95
Euxoa flavicollis - Yellow-lined Dart 96
Euxoa hollemani - Holleman's Dart 96
Euxoa idahoensis - Idaho Dart 94
Euxoa infausta - Variable Dart 93
Euxoa infracta - Broken Dart 95
Euxoa intrita - Tippling Dart 93
Euxoa lactificans - Lactificans Dart 94
Euxoa lidia thanatologia - Sordid Dart 93
Euxoa maimes - Maimes Dart 95
Euxoa manitobana - Manitoba Dart 95
Euxoa medialis - Median-banded Dart 94
Euxoa messoria - Reaper Dart 92
Euxoa mimallonis - Ruddy Dart 93
Euxoa misturata - Misturata Dart 93
Euxoa mitis - Spineless Dart 93
Euxoa moerens - Mourning Dart 95
Euxoa munis - Munis Dart 95
Euxoa niveilinea - White-lined Dart 94
Euxoa nostra - Nostra Dart 96
Euxoa obeliscoides - Obelish Dart 94
Euxoa oberfoelli - Oberfoell's Dart 94
Euxoa oblongistigma - Oblong Dart 94
Euxoa ochrogaster - Red Backed Cutworm 94
Euxoa olivalis - Olivalis Dart 94
Euxoa olivia - Olivia Dart 93
Euxoa pallipennis - Pale Dart 93
Euxoa perexcellens - Elegant Dart 94
Euxoa perolivalis - Perolivalis Dart 95
Euxoa perpolita - Unmarked Ruddy Dart 96
Euxoa pestula - Pestula Dart 93
Euxoa plagigera - Plaited Dart 94
Euxoa pleuritica - Pleuritica Dart 92
Euxoa quadridentata - Four-toothed Dart 94
Euxoa quebecensis - Quebec Dart 96
Euxoa redimicula - Fillet Dart 95
Euxoa ridingsiana - Riding's Dart 95
Euxoa scandens - Climbing Dart 92
Euxoa servita - Servita Dart 95
Euxoa simona - Simon Dart 93
Euxoa spumata - Foamy Dart 93
Euxoa taura - Regina Dart 95
Euxoa teleboa - Teleboa Dart 95
Euxoa tessallata - Tesselate Dart 94
Euxoa tristicula - Three-marked Dart 92
Euxoa tronella - Tronella Dart 95
Euxoa unica - Saskatoon Dart 95
Euxoa velleripennis - Fleece-winged Dart 96
Everes amyntula albrighti - Western Tailed Blue 1, 78
Evolution 66, 121

F

Falcon, Peregrine 22
Falcon, Prairie 22
Falkiner, Margret
  Red Squirrel feeding five of her babies, photo 182
Feeder visitors 163, 178, 183
Feltia herilis - Master Dart 92
Feltia hudsoni - Hudson's Dart 92
Feltia jaculifera - Gothic Dart 92, photo 93
Feltia subgothica - Dingy Cutworm 92
Feltia tricosa - Tricosa Dart 96
Festuca saximontana - Rocky Mountain Fescue 198
Filago arvensis - Fluffweed 127
Finch 6
Finch, Cassin's 205
Finch, House 6
Finch, Purple 14
Finch, Rosy 22
Finland, birds 170, 228
Fisher 46
Flicker, Northern 14
Flicker, Yellow-shafted 158
Flycatcher, Alder 158
Flycatcher, Crested 205
Flycatcher, Great Crested 158
Flycatcher, Least 158
Fossils 66
Fox, Red 46
Fox, Swift 46
Fragaria glauca - Smooth Wild Strawberry 199
Fungus, photo 202

G

Galium boreale - Northern Bedstraw 199
Galium trifidum - Small Bedstraw 199
Galium triflorum - Sweet-scented Bedstraw 199

Garton, Tim
    Great Blue Heron, photo cover no. 3
Gentiana amarella - Northern Gentian 196
Geocaulon lividum - Northern Comandra 199
Geology of South Saskatchewan River 126
Geranium bicknellii - Bicknell's Wild Geranium 196
Geum aleppicum - Yellow Avens 199
Glaucopsyche lygdamus couperi - Silvery Blue 2, 78
Glyceria borealis - Northern Manna Grass 198
Glyptotendipes amplus 202
Glyptotendipes dreisbachi 202
Glyptotendipes unacus 202
Godwit, Hudsonian 39
Godwit, Marbled 39
Goldeneye, Common 4, 149, 158, photo 168
Goldfinch, American 22, 158, 172
Gollop, Bernie
    More about Butterfly Books and a Magazine, 130
    North American butterfly identification guides, photo 131
    Provincial/state butterfly identification guides, photo 132
Goodyera repens - Lesser Rattlesnake Plantain 197
Goose, Bar-headed 137
Goose, Canada 4, 141, photo 143
Goose, Ross' 4, photo 11
Goose, Snow 4
Goose, white 23
Gopher, Northern Pocket 46
Gordon Silversides, 1927-1994 229
Goshawk, Northern 14
Grackle, Common 22, 172, 205
Grasslands ecology, study and teaching 181
Gray Squirrels and Magpies 174
Grosbeak, Evening 6, 204, photo 205
Grosbeak, Pine 6
Grosbeak, Rose-breasted 158
Grouse, 4
Grouse, Ruffed 14, 434, 178
Grouse, Sage 22
Grouse, Sharp-tailed 14, 28, 144, photo 144, 145
Grouse, Spruce 22
Gull 23
Gull, California, 172
Gull, Franklin's 172, photo 170
Gull, Ring-billed 158, 172
Gutfriend, R.
    Aerial view of the nine lagoon cells, photo 36
    Note the varing degrees of wetness, photo 37
Guttipelopia rosenbergi 201
Gymnocarpium dryopteris - Oak Fern 194
Gyrfalcon 22

H

Hairstreak, Acadian 2, 3
Hare, Snowshoe 46
Harkenclenus titus - Coral Hairstreak 2, 77
Harms, Vernon L. and Anna Leighton.
    Flora of the Besnard Lake Area, North-Central Saskatchewan 190
Harris, Wayne C.
    52nd Annual Christmas Bird Count - 1993 4
    Bobcat, Cypress Hills Provincial Park, photo 179
    Bobcat, photo 180
    Close Encounter with a Bobcat 179
    Saskatchewan Christmas Mammal Count - 1993 45
Hawk, 23
Hawk, Broad-winged 158
Hawk, Cooper's 22, 158
Hawk, Red-tailed 158, 172, 178, courtship display 29
Hawk, Rough-legged 22
Hawk, Sharp-shinned 22, 158
Hawk-owl, Northern 216
Heard but Not Necessarily Seen: Surveys of Birds at Greenwater Lake and Moose Mountain Provincial Parks 152
Helopelopia cornuticaudata 201
Heron, Great Blue, photo, cover no. 3
Hesperia assiniboia - Assiniboia Skipper 74
Hesperia comma manitoba - Manitoba Skipper 83
Heterotrissocladius changi 201
Heterotrissocladius oliveri 201
Heuchera richardsonii - Richardson's Alum-root 199
Hieracium umbellatum - Canada Hawkweed 195
Hierochloe odorata - Sweet Grass 198
Hjertaas, Dale G.
    Summer and Breeding Records of the Whooping Crane in Saskatchewan 99
Holroyd, G.L.
    Brewer's Blackbird, Canmore, Alberta, photo 169
Hooper, Donald F.
    Northern Hawk Owl, photo cover no. 1
Hooper, Ronald L.
    Check List of Saskatchewan Moths Part 12: Dart Moths 91
    The House that Jack Built 167
Houston, C. Stuart
    How Did the Canada Goose Get Its Name Before There Was a Canada? 141
Hudson, John H.
    Plant Discoveries in Saskatchewan, 1988-92, Featuring Serpent Spurge and Fluffweed 126
Hummingbird, Ruby-throated 155
Hypericum majus - Large Canada St. John's-wort 197

I

I Am Deer, poem 54

Impatiens capensis - Spotted Touch-me-not 195

J

Jaeger, Pomarine 33, photo 35
James, Paul C.
  January Sighting of a Northern Shrike in Regina 163
  Northern Hawk Owl Irruptions in Saskatchewan: 1990-91 and 1991-92 25
Jay, Blue 14, 158, 172
Jay, Gray 14
Jonker, Peter
  I Am Deer, poem 54
Junco, Dark-eyed 4
Juncus alpinus - Alpine Rush 197
Juncus dudleyi - Dudley's Path Rush 197
Juniperus communis - Low Juniper 195

K

Kalmia polifolia - Pale Laurel 196
Kestrel, 172
Kestrel, American 192
Kiefferulus dux 202
Killdeer 39, 172, photo 171
Kingbird, Western 172
Kinglet, Golden-crowned 6, 22
Knot, Red 40
Kondla, Norbert G.
  Beatton River valley northeast of Fort St. John, B.C., photo 73
Kondla, Norbert G., Edward M. Pike, and Felix A.H. Sperling
  Butterflies of the Peace River Region of Alberta and British Columbia 71
Korol, Burke
  Pomarine Jaeger at Lac La Plonge, Saskatchewan 33

L

Labrundinia pilosella 201
Lahrman, Fred W.
  Bar-headed Goose in Regina, 11 September 1993, photo 138
  A Bar-headed Goose Seen in Regina — a Possible First for North America 137
  Dowitcher Flock Rescues Companion from Merlin 184
  Franklin's Gull, photo 170
  Ross' Goose, photo 11
  Sandstone Outcrops Near Climax, Saskatchewan, photo 70
Langelier, Terry and Randy
  Flying Squirrels in the dead of winter 227
Larix laricina - Tamarack 197, photo 190
Lark, Horned 4, 172
Larsia canadensis 201
Lasiodiamesa rawsoni 201
Lathyrus ochroleucus - Cream-colored Pea-vine 196
Leach, Stephen W.
  Mallard duckling in grouse nest, photo 145
  Mallard egg amongst Sharp-tailed Grouse eggs, photo 144
  Mallard Parasitizes Sharp-Tailed Grouse Nest 144
Ledingham, George, Saskatchewan Order of Merit, 231
Ledum groenlandicum - Common Labrador-tea 196
Lepidium densiflorum - Common Pepper-grass 195
Lepidoptera 1, 71, 91
Letkeman, Catherine, Nature Saskatchewan Fellow 231
Lilium philadelphium - 192, 197
Limentitis arthemis rubrofasciata - White Admiral 1, 81
Linnaea borealis - Twin-flower 195
Longspur, Lapland 14
Lonicera dioica - Twining Honeysuckle 195
Loon, Common 158
Lowe, John
  Tree Swallow, photo 207
Lumbsi, Ken
  Canada Goose, photo 143
Lycaena dorcas dorcas - Dorcas Copper 77
Lycaena helloides - Purplish Copper 77
Lycaena hyllus - Bronze copper 1, 77
Lycaena mariposa - Mariposa Copper 77
Lycopodium annotinum - Stiff Club-moss 197
Lycopodium clavatum - Running Club-moss 197
Lycopodium complanatum - Ground-cedar 197
Lycopodium dendroideum - Ground-pine 197
Lycopus uniflorus - Northern Water-horehound 197
Lynch, Wayne
  Cougar, photo 220
  Savannah Sparrow, photo 159
  Tamarack buds, photo 190
  Tree Swallows, photo 117
  White-crowned Sparrow, photo 169
  Willet, photo 42
Lysimachia thyrsiflora - Tufted Loosestrife 198

M

MacLeod, Astrid
  Partial Albinism: a Challenge to Identification 165
  A partial albino European starling, photo 166
  The mystery bird develops markings, photo 165
Macropelopia decedens 201
Magpie, Black-billed 14, 158, 172, 174, photo 175

Maianthemum canadense - Two-leaved Solomon's-seal 197
Mallard 14, 144, photo 144, 145
Mallard Parasitizes Sharp-Tailed Grouse Nest 144
Mallard x American Black Duck 6
Mammals, counts and surveys 45
Manitoba
  Birtle-Riding Mountain, mammals 219
  Bluemenort, birds 227
  Brandon, mammals 219
  Churchill, birds 149, 161
  Clandeboye Bay, birds 150
  Clearwater Lake Provincial Park, birds 168
  Delta, birds 149, 207
  Grand Beach, birds 149
  Grand Marais, birds 149, 160
  Kleefield, birds 150
  Lake Manitoba, birds 147
  Lake Winnipeg, birds 147, 160, plants 115
  Lepidoptera 96
  Lockport, birds 150
  McArthur Falls, birds 150
  Natalie Lake, birds 149
  Oak Hammock Marsh, birds 150
  Oak Lake, birds 208
  Patricia Beach, birds 150
  Pembina Hills, mammals 219
  Pembina River, birds 29
  Pinawa, birds 149
  Pine Falls, birds 149
  Portage la Prairie, birds 150
  Powerview, birds 150
  Red Rock Lake, birds 149
  Seven Sisters Falls, birds 149
  Somerset, birds 206
  St. Ambroise, birds 150
  Stead, mammals 219
  Waterhen River, mammals ii no. 1
  Windygates, birds 29
  Winnipeg, birds 149, 162, 178; mammals 178
Maple, Manitoba, photo 65
Maps
  Besnard Lake and vicinity, 192
  Location of Besnard Lake in north-central Saskatchewan, 191
Mason, P.G. and D.W. Parker
  Additions and corrections to the list of non-biting midges in Saskatchewan 200
Matricaria matricarioides - Pineapple Weed 195
Maybank, Blake
  Fungus, photo 202
McNair, Douglas B.
  Caching by an irruptive hawk-owl 216
Meadowlark, Western 22, 172
Melampyrum lineare - Cow-wheat 199
Mentha arvensis - Wild Mint 197
Merganser 22
Merganser, Common 149
Merlin 14, 169, 184
Meropelopia flavifrons 201
Mertensia paniculata - Tall Lungwort 155, 195
Mesosmittia acutistylus 201
Meyers, Daisy D.
  Manitoaba Maple uprooted on Meyers ranch by the storm, photo 65
  Nature's Fury 65
  Wind sculpted sand dunes in the Great Sand Hills south of Sceptre, SK 125
Micropsectra connexa 202
Micropsectra polita 203
Midge 200
Mink, American 46
Mitchell, R.A.
  Common Goldeneye sitting in the entrance of her nesting box, Clearwater Lake Provincial Park, MB, photo 168
Mite 204
Mite, Northern Fowl 204
Mitella nuda - Mitrewort 199
Moehringia lateriflora - Grove Sandwort 195
Moneses uniflora - One-flowered Winter green 198
Monodiamesa 201
Montana
  lepidoptera 96
Moose 46
More about Butterbly Books and a Magazine, 130
Moth, Catocaline Dart 91
Mouse 28, 46
Mouse, Deer 46
Mouse, House 46
Muhlenbergia andina - Foxtail Muhly 126
Muskrat 46
Myrica gale - Sweet Gale 197
Myriophyllum exalbescens - American Water-milfoil 196

N
Nanocladius branchicolus 201
Nanocladius crassicornis 203
Nanocladius distinctus 201
Nature Saskatchewan
  1994 Annual General Meeting 231
  Balance sheet 232
  Statement of financial activities 233
Nature's Fury 65
Nero, Robert W.
  Short-tailed Shrew Apparent Cause of Mortality of Eastern Screech-Owl 176
  Snowy Owl Captures Rock Dove in Mid-Air 162
  Thrasher, poem 162
  Unusual Aerial Display of Red-Tailed Hawk 29
Nest boxes, bird 167

New Brunswick, mammals 221
Nine Whooping Cranes 97
Noctuinae - Dart Moths 91
Northern (Bullock's) Oriole at Saskatoon 31
Northern Hawk Owl Irruptions in Saskatchewan: 1990-91 and 1991-92 25
Northwest Territories
  Fort Smith, lepidoptera 96
  Wood Buffalo National Park, birds 116
Nuphar variegatum - Yellow Pond-lily 197
Nuthatch 163
Nuthatch, Red-breasted 4, 158, 216
Nuthatch, White-breasted 14, 205
Nymphalis antiopa - Mourning Cloak 2, 81
Nymphalis milberti - Milbert's Tortoise Shell 2, 81
Nymphalis vau-album - Compton Tortoise Shell 81

O

Oarisma garita - Garita Skipper 2, 3, 74
Oeneis alberta - Alberta Arctic 83
Oeneis chryxus caryi - Chryxus Arctic 83
Oeneis jutta ridingiana - Jutta Arctic 83
Oeneis macounii - Macoun's Arctic 82
Oeneis uhleri - Uhler's Arctic 82
Oldsquaw 147
Oliphant, Lynn, Conservation Award 231
Ontario
  Manitoulin Island 148
Onychagarotis rileyana - Riley's Dart 92
Oriole, Northern (Baltimore) 31, 158, 172
Orthilia secunda - One-sided Wintergreen or Pyrola 198
Orthocladius lignicola 201
Orthocladius obumbatus 203
Orthocladius rivulorum 201
Orthocladius smolandicus 201
Oryzopsis asperifolia - White-grained Mountain-rice 198
Oryzopsis pungens - Slender Mountain-rice 198
Otter, River 46
Ovenbird 158
Owl 4
Owl, Boreal 22, 216
Owl, Eastern Screech- 176
Owl, Great Gray 22, 176, 228, photos 228
Owl, Great Horned 14, 172
Owl, Long-eared 22
Owl, Northern Hawk 22, 25, photo cover no. 1
Owl, Northern Saw-whet 22
Owl, Short-eared 6
Owl, Snowy 14, 162
Owlet Moths 91
Oxycoccus microcarpus - Small Bog Cranberry 196
Oxycoccus quadripetalus - Larger Swamp Cranberry 196

P

Pagastiella ostansa 202
Paleontology 66, 121
Papilio canadensis - Canadian Swallowtail 75
Papilio glaucus - Tiger Swallowtail 2
Papilio machaon pikei - Old World Swallowtail 74
Papilio zelicaon - Zelicaon Swallowtail 75, photo 72
Partial Albinism: a Challenge to Identification 165
Parachironomus forceps 202
Parachironomus monochromus 202
Parachironomus varus 202
Parakiefferiella subaterrima 201, 203
Parakiefferiella tortulata 203
Paramerina fragilis 201
Parametriocnemus lundbeckii 201
Paratanytarsus confusus 203
Paratanytarsus dissimilis 203
Paratanytarsus kaszabi 202
Paratanytarsus tenuis 202
Parnassia palustris - Northern Grass-of-Parnassus 199
Parochlus kiefferi 201
Partridge, Gray 14
Pasque-flower 115
Peewee, Western Wood 158
Pelican, American White 172
Pepper, Jeannette
  January Sighting of a Northern Shrike in Regina 163
Perrault, Lise, Nature Saskatchewan Fellow 231
Petasites palmatus - Palmate-leaved Colt's-foot 195
Phacelia franklinii - Franklin's Scorpion-weed 197
Phaenopsectra punctipes 202
Phalaris arundinacea - Reed Canary Grass 198
Phalarope, Red-necked 39
Phalarope, Wilson's 39
Pheasant, Ring-necked 14
Phragmites australis - Common Reed Grass 198
Phyciodes batesii - Tawny Crescent 2, 80
Phyciodes morpheus - Northern Crescent 2, 80
Phyciodes prataensis - Field Crescent 81
Phyciodes tharos - Pearl Crescent 2
Picea glauca - White Spruce 197
Picea mariana - Black Spruce 197
Pieris napi oleracea - Mustard White 75
Pieris occidentalis - Western Checkered White 2, 75
Pieris rapae - Cabbage White 2, 75
Pieris sisymbrii - California White 83
Pike Lake Butterfly Census 1986-1992 1
Pintail, Northern 22
Pinus banksiana - Jack Pine 197

Pivnick, Ken
Pike Lake Butterfly Census 1986-1992 1
Plant Discoveries in Saskatchewan, 1988-92, Featuring Serpent Spurge and Fluffweed 126
Plantago major - Common Plantain 197
Platanthera hyperborea - Northern Green Bog Orchid 197
Platanthera obtusata - Small Northern Bog Orchid 197
Plebejus idas scuderi - Northern Blue 78
Plebejus melissa - Melissa Blue 2, 83
Plebejus optilete yukona - Yukon Blue 83
Plebejus rusticus - Rustic Blue 78
Plebejus saepiolus amica - Greenish Blue 2, 78
Plover, Black-bellied 39, photo 40
Plover, Lesser Golden 38
Plover, Semipalmated 39
Poa arctica - Arctic Blue Grass 192, 198
Poa interior - Inland Blue Grass 198
Poa palustris - Fowl Blue Grass 198
Poland, birds 170
Polites mystic dacotah - Long Dash 1, 74
Polites peckius - Peck's Skipper 2, 3, 83
Pollock, John, book review by 181
Polygonia faunus - Green Comma 81
Polygonia gracilis - Hoary Comma 81
Polygonia progne - Gray Comma 2, 81
Polygonia satyrus - Satyr Anglewing 2, 81
Polygonum amphibium - Water Swamp Persicaria 198
Polygonum cilinode - Fringed Black Bindweed 198
Polygonum punctatum - Dotted Water Smartweed 192, 198
Polypedilum convictum 203
Polypedilum digitifer 203
Polypedilum halterale 203
Polypedilum nubeculosum 202
Polypedilum obtusum 203
Polypodium virginianum - Common Polypody 198
Pomarine Jaeger at Lac La Plonge, Saskatchewan 33
Populus balsamifera - Balsam Poplar 199
Populus tremuloides - Trembling Aspen 199
Porcupine, American 46
Potamogeton gramineus - Grass-leaved Pondweed 198
Potamogeton natans - Common Floating Pondweed 198
Potamogeton pusillus - Small Pondweed 198
Potamogeton richardsonii 198
Potamogeton zosteriformis - Eel-grass Pondweed 198
Potentilla norvegica - Rough Cinquefoil 199
Potentilla palustris - Marsh Cinquefoil 199
Potentilla pensylvanica - Prairie Cinquefoil 199
Procladius culiciformis 201
Procladius denticulatus 203
Procladius dentus 201
Procladius freemani 203
Procladius ruris 201
Prunus pensylvanica - Pin Cherry 199
Psectrocladius barbimanus 201
Psectrocladius flavus 203
Psectrotanypus dyari 203
Pseudochironomus middlekauffi 202
Pulsatilla ludoviciana - Crocus Anemone 198
Puma (Cougar) 218, photo 220
Puzzles of the Past: the Way We Were and the Way We Are Going 66
Pyrgus centaureae freija - Grizzled Skipper 73
Pyrgus communis - Checkered Skipper 2, 73
Pyrola asarifolia - Pink Wintergreen 198
Pyrola elliptica - Common Shinleaf 198
Pyrola virens - Green-flowered Wintergreen 198

Q
Quebec
James Bay, mammals 221
Magdalen Islands, birds 216

R
Rabbit, White-tailed Jack 45
Raccoon 46
Radio-tracking 116
Ranunculus flammula - Creeping Spearwort 198
Ranunculus gmelinii - Small Yellow Watercrowfoot 198
Ranunculus lapponicus - Lapland Buttercup 198
Ranunculus pensylvanicus - Bristly Buttercup 199
Rat, Norway 46
Rattlesnake 173
Raven, Common 14, 30, 158
Recent Records of Oldsquaw in Southeastern Manitoba 147
Redhead 22
Redpoll 23, 163
Redpoll, Common 4
Redpoll, Hoary 14
Redstart, American 158
Relative Abundance of Birds during the Breeding Season in Saskatoon, Saskatchewan 169
Rescue operation - swallows 213
Ribes glandulosum - Skunk Currant 196
Ribes hudsonianum - Northern Black Currant 196
Ribes oxyacanthoides - Northern Gooseberry 196
Richardson, Gillian
Destination: Aransas National Wildlife Refuge, Texas, January 1993 61
Ritchie, Isabel
Caught in the Act 182

Robin, American 4, 157, 170, 172; photo 157
Roney, Keith
  Army cutworm (Euxoa auxiliaris (Grt.)), photo 95
  Dark Sword Grass (*Agrotis ipsilon* (Hufn.)), photo 92
  Gothic Dart (*Feltia jaculifera* (Gn.)), photo 93
  The Grand Copablepharon (*Copablepharon grande* (Stkr.)), photo, 94
Rosa acicularis - Prickly Wild Rose 199
Rosa woodsii - Wood's Wild Rose 199
Roy, Frank J.
  Alvena Schnell 57
Rubus idaeus - Wild Red Raspberry 199
Rubus pubescens - Dewberry 199
Ruffed Grouse Dance 43
Rumex triangulivalvis - Willow-leaved Dock 198

S

Sagittaria cuneata - Arum-leaved Arrowhead 194
Salix pedicellaris - Bog Willow 199
Salix petiolaris - Basket Willow 199
Salix planifolia - Flat-leaved Willow 199
Salix pyrifolia - Balsam Willow 199
Sand dunes, photo 125
Sanderling 39
Sandpiper, Baird's 38
Sandpiper, Least 39
Sandpiper, Pectoral 40
Sandpiper, Semipalmated 39
Sandpiper, Solitary 39
Sandpiper, Spotted 39, 158, photo 41
Sandpiper, Stilt 38
Sandpiper, Upland 39
Sandpiper, Western 38
Sandpiper, White-rumped 40
Sapsucker, Yellow-bellied 22, 158
Saskatchewan
  Abernethy, CBC 6
  Adams Creek, plants 129
  Aquadell, plants 128
  Arcola, birds 156, CBC 6
  Armit, CBC 6
  Assiniboia, CBC 6
  Aylsham, lepidoptera 92
  Bangor, CBC 6
  Besnard Lake, plants 190
  Bethune, CBC 6
  Big Muddy Lake, CBC 6
  Biggar, CBC 6
  Birch Hills, CBC 6
  Bladworth, plants 127
  Broadview, CBC 6
  Bromhead, CBC 6
  Buffalo Pound Provincial Park, lepidoptera 93
  Cabri, CBC 6
  Candle Lake, birds 25, CBC 6
  Canora, lepidoptera 95
  Caton Creek, plants 127
  Cecil Ferry, CBC 6
  Clark's Crossing, CBC 7
  Climax, sandstone outcrops, photo 70
  Condie, birds, photo 171
  Coronach, lepidoptera 93
  Craven, CBC 7
  Crooked Lake, CBC 7
  Cumberland Delta, birds 113
  Cutknife, lepidoptera 92
  Cypress Hills, lepidoptera 91, plants 128
  Cypress Hills Provincial Park, mammals 179
  Dalmeny, CBC 7
  Dilke, CBC 7
  Duval, CBC 7
  Eastend, lepidoptera 93, plants 129
  Edam, CBC 7
  Elbow, lepidoptera 94
  Emma Lake, plants 126
  Endeavour, CBC 7
  Fenton, CBC 7
  Fort Qu'Appelle, CBC 6, birds 43, lepidoptera 95
  Fort Walsh, CBC 7, plants 129
  Gardiner Dam, CBC 7
  Good Spirit Lake, CBC 7
  Govenlock, CBC 7
  Grand Centre, CBC 7
  Grassland National Park, CBC 7
  Great Sand Hills, photo 125
  Greenwater, birds 153, plants, 155, photo 152
  Grenfell, CBC 7
  Gull Lake 94
  Harlan, lepidoptera 92
  Hepburn, CBC 7
  High Plains, plants 128
  Hudson Bay, birds 25, CBC 7
  Humboldt, CBC 7
  Indian Head, CBC 7, birds 206
  Kamsack, CBC 6
  Katepwa Lake, CBC 6
  Kelvington, CBC 7
  Kenaston, CBC 7
  Killdeer, lepidoptera 94
  Kilwinning, CBC 7
  Kindersley, CBC 7
  Kinloch, CBC 7
  Kiyiu Lake, birds 113
  Kutawagan Lake, CBC 8
  Kyle, CBC 8
  La Ronge, CBC 8
  Lac La Plonge, birds 33
  Lancer Ferry, plants 126
  Last Mountain Lake area, birds 113
  Last Mountain Lake N.W.A., CBC 8
  Leader, CBC 6, plants 65, 128
  Lemsford Ferry, plants 126
  Lestock, lepidoptera 95
  Livelong, CBC 8

Loon Lake, CBC 8
Love, CBC 8
Luck Lake, birds 113
Luseland, CBC 8
MacDowall, CBC 8
Madge Lake, mammals 182
Marsden, CBC 8
Maryfield, lepidoptera 93
Meadow Lake (NW), CBC 8
Meadow Lake (Town), CBC 8
Melfort, birds 25, CBC 8; lepidoptera 94
Melville, CBC 8
Missinipe, CBC 8
Moose Jaw, CBC 6
Moose Mountain, CBC 8
Moose Mountain Provincial Park, birds 153, 156; photo 153, 156
Moose Woods, plants 128
Nicolle Flats, CBC 8
Nipawin, birds 25, CBC 8
Oxbow, lepidoptera 93
Pasquia Hills, mammals 218
Piapot, lepidoptera 91
Pierceland, CBC 7
Pike Lake, CBC 8, lepidoptera 1
Pinto Butte, plants 128
Portreeve, lepidoptera 91
Prince Albert, birds 25, CBC 8
Prince Albert National Park, CBC 8
Punnichy, lepidoptera 95
Qu'Appelle Valley, birds 43
Qu'Appelle Valley Dam, CBC 8
Quill Lakes, birds 113
Quinton, lepidoptera 95
Ravenscrag, plants 127
Raymore, CBC 8
Regina, CBC 8; birds 98, 137, 163, 172, 174, 213; lepidoptera 94;mammals 174; plants 127
Richardson, birds 184
Rockglen, CBC 9
Rose Valley, CBC 9
Rosetown, plants 128
Round Prairie cemetery, plants 128
Saltcoats, CBC 6
Saskatchewan Landing, CBC 8
Saskatchewan Landing Provincial Park, CBC 6, CBC 9, lepidoptera 95
Saskatoon, CBC 9; birds 25, 31, 169, 206; lepidoptera 91, plants 115
Sceptre, photo 125
Scott, CBC 9
Scout Lake, lepidoptera 94
Shaunavon, lepidoptera 94
Shoal Lake, lepidoptera 93
Simmie, plants 128
Skull Creek, CBC 9
Snowden, CBC 9
South Saskatchewan River, geology 126
Spalding, CBC 9, birds 183
Spinney Hill, CBC 9
Spring Valley, CBC 9
Spruce Home, CBC 9
Spy Hill, birds 207
Squaw Rapids, birds 25, CBC 9
Stewart Lake, photo 153
Swift Current, CBC 6; lepidoptera 91
Torch River, CBC 8
Turtle Lake (1), CBC 9
Turtle Lake (2), CBC 9
Val Marie, CBC 9, lepidoptera 94
Weekes, birds cover no. 1
Weyburn, CBC 6, birds 36, sewage cells 36
Wideview, plants 128
White Bear, CBC 9
Whitemud formation, plants 128
Whitewood, CBC 9
Willow Bunch, lepidoptera 94
Wood Mountain, plants 128
Wood River, plants 128
Yorkton, CBC 9
Yorkton wetlands complex, birds 113
Saskatchewan Christmas Mammal Count - 1993 45
Saskatchewan Natural History Society
    Proposed Amendments to the SNHS Constitution ii no. 2
Satyrium liparops - Striped Hairstreak 77
Saxifraga tricuspidata - Three-toothed Saxifrage 199
Scaup, Lesser 22
Schizachne purpurascens - Purple Oat-grass 198
Schmeiser, Douglas, photo 234
Schnell, Alvena 57
Scirpus cyperinus - Wool-grass 196
Scirpus hudsonianus - Alpine Cotton-grass 196
Scirpus microcarpus - Small-fruited Sedge 196
Scoter, Black and White-winged 149
Scoter, Surf 149
Seib, Gary W.
    Drosera rotundifolia, photo 194
        landscape, photo 189
    Killdeer at Condie, photo 171
Senecio indecorus - Unsightly Groundsel 195
Senecio pauperculus - Depauperate Groundsel 195
Sergentia coracina 202
Sewage cells 36
Short-tailed Shrew Apparent Cause of Mortality of Eastern Screech-Owl 176
Shrew 46
Shrew, Masked 46
Shrew, Short-tailed 176
Shrike, Northern 14, 163
Silversides, Gordon 229, photo 229
Siskin, Pine 4, 163
Sisymbrium loeselii - Tall Hedge Mustard 195

Sium suave - Water Parsnip 194
Skunk, Striped 46
Smilacina trifolia - Three-leaved Solomon's-seal 197
Snipe, Common 6
Snowy Owl Captures Rock Dove in Mid-Air 162
Sodhi, Navjot S.
  Relative Abundance of Birds during the Breeding Season in Saskatoon, Saskatchewan 169
Solidago canadensis - Canada Goldenrod 195
Solidago hispida - Shaggy Goldenrod 195
Solidago spathulata - Mountain Goldenrod 195
Song Sparrow at Winter Feeder 183
Sparganium angustifolium - Narrow-leaved Bur-reed 199
Sparganium eurycarpum - Broad-fruited Bur-reed 199
Sparrow, American Tree 22
Sparrow, Chipping 6, 158, 170
Sparrow, Clay-coloured 158, 172
Sparrow, Fox 6
Sparrow, Harris' 14
Sparrow, House, 4, 28, 170, 205
Sparrow, Lincoln's 6
Sparrow, Savannah 158, photo 159
Sparrow, Song 22, 157, 170, 183
Sparrow, Vester 6
Sparrow, White-crowned 22, 172
Sparrow, White-throated 22, 155, 172
Sperling, Felix
  Fifth instar (Papilio Zelicaon) from Dixonville, Alberta, photo 72
Speyeria aphrodite manitoba - Aphrodite Frittillary 1, 79
Speyeria cybele pseudocarpenteri - Great Spangled Fritillary 2, 79
Speyeria electa - Northwestern Fritillary 1, 79
Speyeria hollandi - Boreal Fritillary 79
Speyeria mormonia euronome - Mormon Fritillary 2, 79
Spiranthes romanzoffiana - Hooded Ladies'-tresses 197
Sjpizawka, Velma
  Song Sparrow at Winter Feeder 183
Squirrel 46
Squirrel, American Red 46
Squirrel, Flying 227
Squirrel, Fox 46
Squirrel, Gray 46, 174, photo 174
Squirrel, Northern Flying 46
Squirrel, Red 28, 182; photo 182
Stachys palustris - Marsh Hedge-nettle 197
Starling, European 14, 172;
  partial albino 165, photo 165
Stellaria calycantha - Northern Chickweed 195
Stellaria longifolia - Long-leaved Stitchwort 195
Stellaria longipes - Long-stalked Chickweed 195
Stempellinella 202
Stenochironomus hilaris 203
Stictochironomus marmoreus 202
Stictochironomus quagga 202
Stictochironomus rosenschoeldi 202
Stiles Donald J. and Mary I. Houston
  Distant Travels of Tree Swallows of the Prairie Provinces, 1968-1992 206
Storm damage 65
Sulphur, Queen Alexandra's 2
Summer and Breeeding Records of the Whooping Crane in Saskatchewan 99
Swallow, Barn 157
Swallow, Tree 158, 167, 172, 206, 213; photo 117, 167, 207
Swan, Tundra 22
Switzer, Frank A.
  1992/93 logging area at Moose Mountain, photo 156
  Heard but Not Necessarily Seen: Surveys of Birds at Greenwater Lake and Moose Mountain Provincial Parks 152
  Larry Morgotch Award 231
  Spotted Sandpiper, photo 41
  Stewart Lake trail at Moose Mountain, photo 153
  Typical road fringe habitat found along the Grid Road at Greenwater, photo 152

T

Tanytarsus buckleyi 202
Tanytarsus mendax 202
Taylor, Ernie
  Two Brown Thrasher eggs in snag nest, photo 161
Taylor, Peter S.
  Black-bellied Plover, photo 40
  Recent Records of Oldsquaw in Southeastern Manitoba 147
Teal, Green-winged 22
Thornton, Fred, Joce Bowman, and David Struthers
  Agricultural policy review part 3: Municipal assessment and taxation. 185
Thorybes pylades - Northern Cloudy Wing 72
Thrasher, Brown 160, photo 161
Thrasher, poem 162
Tischendorf, Jay W. and F. Robert Henderson
  The Puma in the Central Mountains and Great Plains - a Synopsis 218
Tokaryk, Tim T.
  Puzzles of the Past: The Way We Were and the Way We Are Going 66
  Treasures on the Shelves 121
Tosh, George
  Three-flowered Avens, photo cover no. 4

Towhee, Rufous-sided 6, 157
A Tribute to Alvena Schnell, Monday, 26 October 1992 57
Trientalis borealis - Northern Star Flower 198
Trifolium repens - White Clover 196
Turkey, Wild 22
Typha latifolia - Cat-tail 199

U

United States
  Arizona, birds 170
  Colorado, mammals 218
  Nebraska, birds 178; mammals 178
  Georgia, birds 207
  Kansas, mammals 218
  Louisiana, birds 207
  Minnesota, birds 148, 150, 206
  Mississippi, birds 207
  Missouri, birds 207
  Nebraska, mammals 218
  North Dakota, birds 206, mammals 218
  South Carolina, birds 207
  South Dakota, birds 149, mammals 218
  Texas, birds, 61, 116
  Utah, mammals 218
  Wisconsin, birds 207
  Wyoming, mammals 218
Unusual Aerial Display of Red-Tailed Hawk 29
Unusual Nest Site of Brown Thrasher 160
Urban birds 169
Utricularia intermedia - Flat-leaved Bladderwort 197

V

Vaccinium myrtilloides - Canada Blueberry 196
Vaccinium vitis-idaea - Lingenberry 196
Van Scheik, William J.
  Burrowing Mites that Pester Birds 204
Vanessa atalanta - Red Admiral 2, 81
Vanessa cardui - Painted Lady 2, 81
Veery 158
Viburnum edule - Low Bush Cranberry 195
Vicia americana - American Vetch 196
Viola adunca - Early Blue Violet 199
Viola palustris - Marsh Violet 199
Viola renifolia - Kidney-leaved Violet 199
Vireo, Red-eyed 158, 172
Vireo, Warbling 158
Vireo, Yellow-throated 158
Vole 46, 177
Vole, Gapper's Red-backed 46
Vole, Meadow 46, 176
Vulture, Turkey 22

W

Waldemir Yanchinski 55
Walker, Ed, Nature Saskatchewan Fellow 231
Walley, Harlan D., book reviews by 116
Wanders, Ignaz
  Albino Great Gray Owl in Finland 228
  Great Gray Owl, photos 228
Warbler, Black-and-white 158
Warbler, Chestnut-sided 158
Warbler, Mourning 158
Warbler, Orange-crowned 158
Warbler, Yellow, 158, 172
Waxwing 23
Waxwing, Bohemian 14
Waxwing, Cedar 4, 158, 172
Weasel ii no. 1, 46
Weasel, Least ii no. 1, 46
Weasel, Long-tailed ii no. 1, 46
Weasels Come in Three Basic Sizes? ii no. 1
Weyburn Shorebird Study: 1990-1992 36
Whimbrel 39
Wigeon, American 22
Willet 38, photo 42
Wolf 46, 117
Woodpecker 23
Woodpecker, Black-backed 22
Woodpecker, Downy 14, 158
Woodpecker, Hairy 14, 28, 158
Woodpecker, Pileated 14, 28
Woodpecker, Three-toed 22
Woodsia ilvensis - Rusty Woodsia 194
Wren, House 119, 157, 167, 172
Wright, D.H.
  Northern (Bullock's) Oriole at Saskatoon 31

X

Xenochironomus scopulus 203

Y

Yanchinski, Waldemir 55
Yellowlegs, Greater 38
Yellowlegs, Lesser 38
Yellowthroat, Common 158
Yukon, mammals 221

Z

Zavrelimyia sinuosa 201

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